ORDER NO. HAD8506119C5
A2

Service Manual

QUARTZ Synthesizer
TV/FM/AM Stereo Receiver

Receiver

SA-560
SA-956

Color

(S)...Silver Type
(K)...Black Type

Color	Areas
(S)	[M] ...U.S.A. (SA-560)
(S)	[MC]...Canada (SA-560)
(S)	[PA] ...Far East PX (SA-560)
(S)	[PE] ...European Military (SA-560)
(S) (K)	[PC] ...European Audio Club. (SA-560)
(K)	[M] ...U.S.A. (SA-956)
(K)	[MC]...Canada (SA-956)

SPECIFICATIONS (IHF '78)

■ AMPLIFIER SECTION

Rated minimum sine wave RMS power output
20 Hz~20 kHz both channels driven
0.007% total harmonic distortion
70W per channel (8 ohms)

1 kHz continuous power output both channels driven 0.007% total harmonic distortion	75W per channel (8 ohms)
Dynamic headroom	1.8 dB (8 ohms)
Total harmonic distortion	
rated power at 20 Hz~20 kHz	0.007% (8 ohms)
half power at 20 Hz~20 kHz	0.005% (8 ohms)
half power at 1 kHz	0.0015% (8 ohms)
SMPTE intermodulation distortion	0.01% (8 ohms)
Frequency response	
PHONO	RIAA standard curve ±0.8 dB
CD/AUX, TAPE 1/VCR, TAPE 2, TAPE 3/EXT	5 Hz~100 kHz, −3 dB
Input sensitivity	
PHONO	0.3 mV (2.5 mV, IHF '66)
CD/AUX, TAPE 1/VCR, TAPE 2, TAPE 3/EXT	18 mV (150 mV, IHF '66)
S/N (IHF, A)	
PHONO	75 dB (81 dB, IHF '66)
CD/AUX, TAPE 1/VCR, TAPE 2, TAPE 3/EXT	78 dB (95 dB, IHF '66)
Maximum input voltage	
PHONO	150 mV (160 mV, 1 kHz)
Input impedance	
PHONO	47 kilohms
CD/AUX, TAPE 1/VCR, TAPE 2, TAPE 3/EXT	22 kilohms
Tone controls	
BASS	50 Hz, +10 dB~−10 dB
TREBLE	20 kHz, +10 dB~−10 dB
Loudness control (volume at −30 dB)	50 Hz, +9 dB
Low frequency damping factor	40 (8 ohms)
	20 (4 ohms)
Load impedance MAIN or REMOTE	4~16 ohms
MAIN and REMOTE	8~16 ohms
Subsonic filter	30 Hz, −6 dB/oct.
High filter	7 kHz, −6 dB/oct.
Headphones output impedance	330 ohms

■ FM TUNER SECTION

Frequency range	87.9~107.9 MHz
Sensitivity	10.8 dBf (1.9μV, IHF '58)
50 dB quieting sensitivity	
MONO	16.1 dBf (3.5μV IHF '58)
STEREO	38.3 dBf (45μV IHF '58)
Total harmonic distortion	
1 kHz	0.08% (MONO), 0.15% (STEREO)
S/N	
MONO	78 dB
STEREO	72 dB
Frequency response	20 Hz~15 kHz, +1 dB, −2 dB
Alternate channel selectivity	70 dB
Capture ratio	1.0 dB
Image rejection at 98 MHz	55 dB
IF rejection at 98 MHz	80 dB
Spurious response rejection at 98 MHz	82 dB
AM suppression	55 dB
Stereo separation	
1 kHz	40 dB
10 kHz	30 dB
Carrier leak	
19 kHz	−60 dB
38 kHz	−60 dB
Antenna terminals	300 ohms (balanced)
	75 ohms unbalanced)

Matsushita Engineering and Service Company
50 Meadowland Parkway,
Secaucus. New Jersey 07094

Panasonic Hawaii Inc.
91-238 Kauhi St. Ewa Beach
P.O. Box 774
Honolulu, Hawaii 96808-0774

Matsushita Electric of Canada Limited
5770 Ambler Drive, Mississauga,
Ontario, L4W 2T3

Panasonic Sales Company, Division of Matsushita Electric of Puerto Rico, Inc.
Ave, 65 De Infanteria, KM 9.7
Victoria Industrial Park
Carolina, Puerto Rico 00630

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

Panasonic Tokyo Office
Matsushita Electric Trading Co., Ltd.
1-2, 1-chome, Shibakoen, Minato-ku, Tokyo 105, Japan

■ AM TUNER SECTION

Frequency range	530~1720 kHz
Sensitivity	20 μV, 300 μV/m
Selectivity	55 dB
Image rejection at 1000 kHz	40 dB
IF rejection at 1000 kHz	60 dB

■ TV TUNER SECTION (without video output)

Frequency range	VHF 2~13ch.
Antenna terminals	75 ohms
Stereo separation at 1 kHz	30 dB
Total haramonic distortion at 1 kHz	
Stereo	0.2%
Separate Audio	0.5%
Frequency responce	
Stereo	50 Hz~10 kHz ±1 dB
Separate Audio	50 Hz~8 kHz ±2 dB

■ GENERAL

Power consumption	270W 333 VA
Power supply	
	For U.S.A. and Canada AC 120V, 60 Hz
	For other AC 50 Hz/60 Hz, 110V/127V/220V/240V
Dimensions (W×H×D)	430 × 110 × 283 mm
	(16-15/16" × 4-11/32" × 11-5/32")
Weight	7.9 kg
	(17.4 lb.)

Note:
Total harmonic distortion is measured by the digital spectrum analyzer (HP. 3045 system).

(Specifications are subject to change without notice for further improvement.) (Weights and dimensions shown are approximate.)

■ CONTENTS

	Page
SAFETY PRECAUTIONS	2
LOCATION OF CONTROLS	3
OUTLINE OF TV VOICE MULTIPLEX BROADCAST	4
CONNECTIONS FOR TV BROADCASTS	6
OPERATION	7
PROTECTION CIRCUITRY	8
BEFORE REPAIR AND ADJUSTMENT	8
DISASSEMBLY INSTRUCTIONS	8
HOW TO REPLACE IC'S (Small outline type)	10
TROUBLE SHOOTING GUID	11
MEASUREMENTS AND ADJUSTMENTS	13
WIRING CONNECTION DIAGRAM	21
PRINTED CIRCUIT BOARDS	23
RESISTORS AND CAPACITORS	28
FUNCTION OF TERMINAL	30
BLOCK DIAGRAM	33
OPERATIONAL DESCRIPTION OF IC801 FOR MUTING	38
SCHEMATIC DIAGRAM	39
DESCRIPTION OF LCD PANEL	48
TERMINAL GUIDE OF TRANSISTORS, DIODES AND IC'S	48
REPLACEMENT PARTS LIST	49
EXPLODED VIEW	51

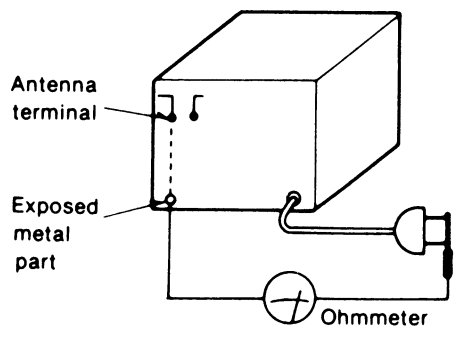
■ SAFETY PRECAUTION

1. Before servicing, unplug the power cord to prevent an electric shock.
2. When replacing parts, use only manufacturer's recommended components for safety.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
5. Before returning the serviced equipment to the customer, be sure to make the following insulation resistance test to prevent the customer from being exposed to a shock hazard.

• INSULATION RESISTANCE TEST

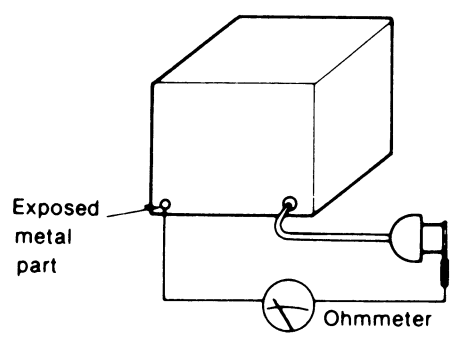
1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screwheads antenna, control shafts, handle brackets, etc. Equipment with antenna terminals should read between 3MΩ and 5.2MΩ to all exposed parts. (Fig. A) Equipment without antenna terminals should read approximately infinity to all exposed parts. (Fig. B)

Note: Some exposed parts may be isolated from the chassis by design. These will read infinity.



(Fig. A)

Resistance = 3MΩ—5.2MΩ

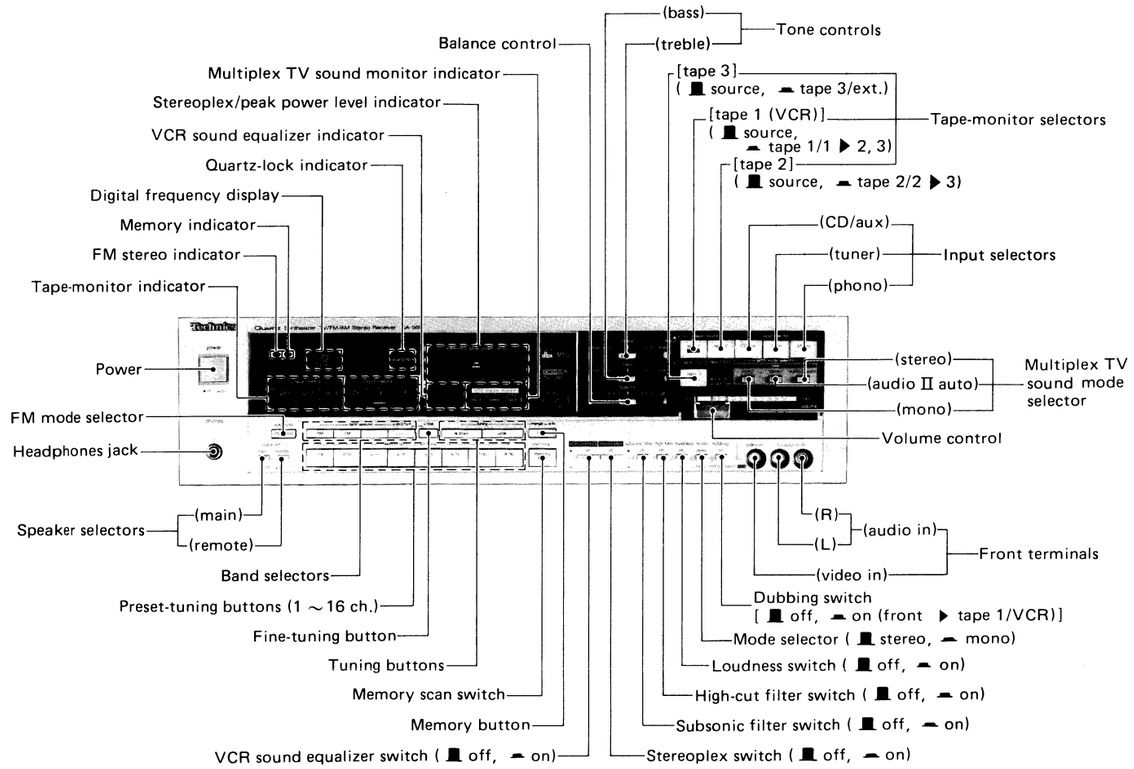


(Fig. B)

Resistance = Approx ∞

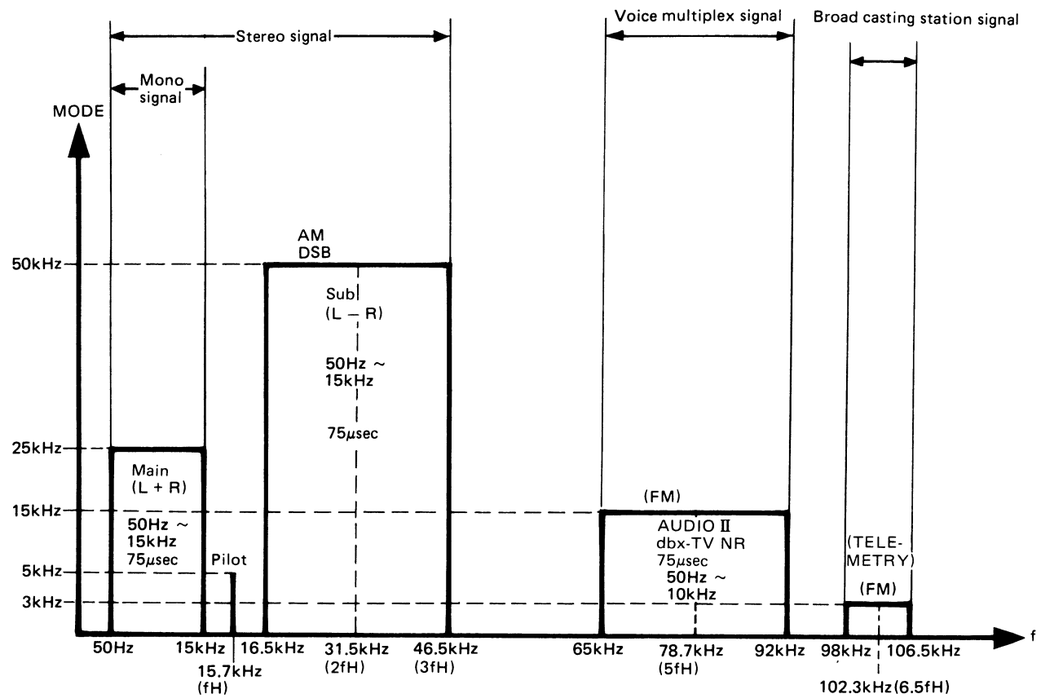
4. If the measurement is outside the specified limits, there is a possibility of a shock hazard. The equipment should be repaired and rechecked before it is returned to the customer.

■ LOCATION OF CONTROLS



■ OUTLINE OF TV VOICE MULTIPLEX BROADCAST

- **The signal spectrum diagram of TV voice multiplex broadcast is shown below.**



SIGNAL SPECTRUM OF TV VOICE MULTIPLEX BROADCAST

[Fig. 1]

- **Description of the component signals of the signal spectrum diagram**

1. (L + R), (L − R) and pilot signal

(1) (L + R) ➡ Pre-emphasized signal of frequency band 50 Hz ~ 15kHz, modulation rate max. 25kHz dev. 75μsec.

(2) (L − R) ➡ Pre-emphasized signal of frequency band 16.5kHz ~ 46.5kHz, modulation rate max. 50kHz dev. 75μsec. and dbx encoded AM DSB signal.

(3) Pilot signal ➡ Video horizontally synchronized signal (15.73426 kHz) is used. Modulation rate is 5 kHz dev.

Since the pilot signal is delivered during stereo broadcast only, the presence of a pilot signal can be used to deteramine if a station is being broadcast in stereo.

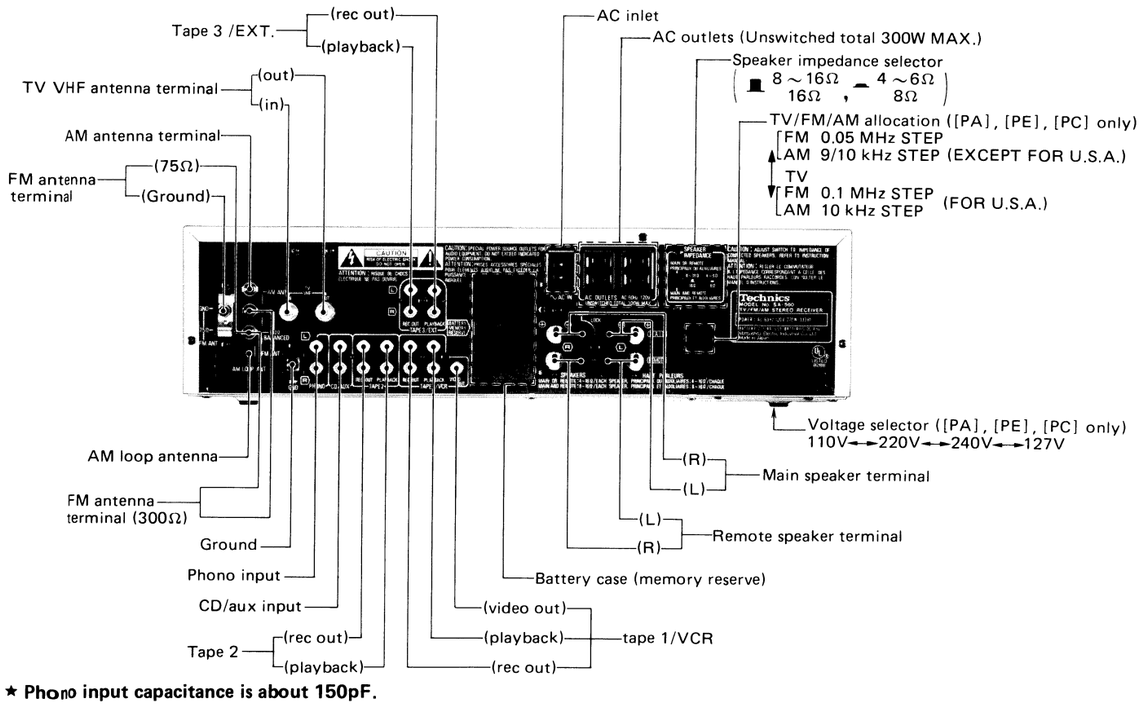
Also, (L − R) signal is subjected to AM modulation (DSB). The purpose of this is to improve the S/N ratio of high frequency range.

2. Audio II signal

It is sub-voice, FM-modulated centering around 78.7kHz, and is used as the voice multiplex broadcasting signal. It is pre-emphasized and dbx encoded FM signal of frequency band 65 kHz ~ 92kHz, modulation rate is 15kHz dev. 75 μsec.

3. Broadcasting station signal

The signal is FM-modulated centering around 102.3kHz and is used for station-to-station communication. It is FM signal of frequency band 98.2kHz ~ 106.5kHz, modulation rate 3kHz dev.



★ **Phono input capacitance is about 150pF.**

• Operational description

A. L + R (MAIN)

The MPX signal is the input to pin ① , of IC401 then the AUDIO II and TELEMETERY signals are eliminated by Stereo LPF. Next, the pilot is cancelled. Finally, L – R is eliminated by L + R LPF, and only L + R is input into the matrix.

B. L – R (SUB)

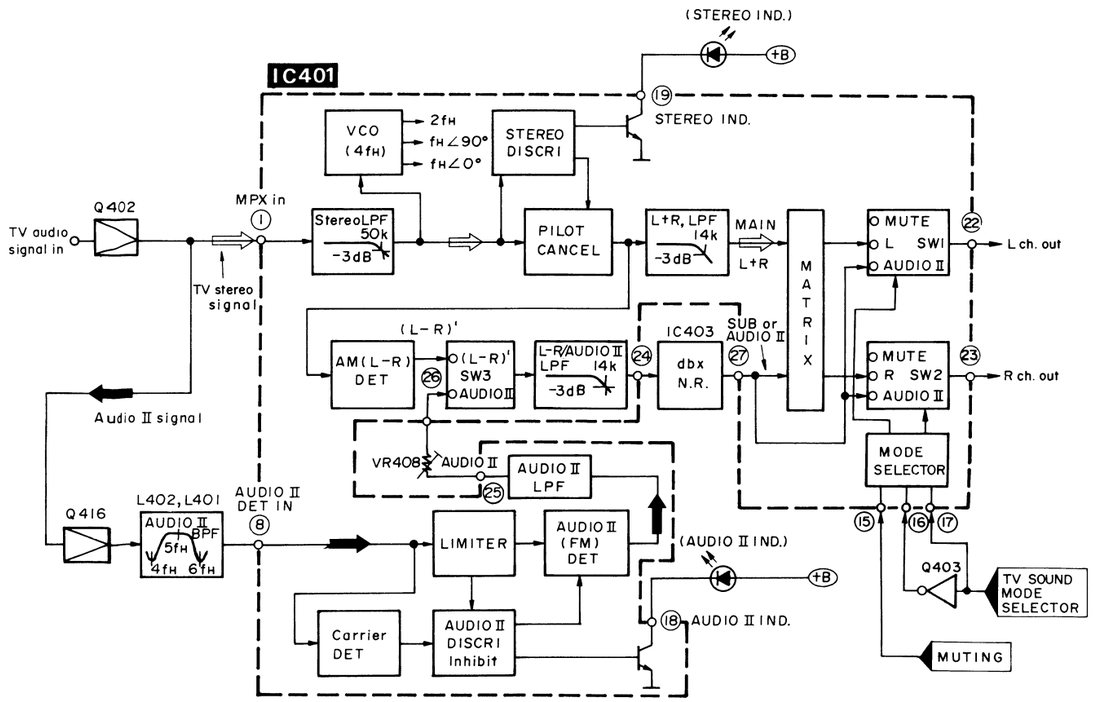
The procedure up to pilot signal cancel is the same as for L + R. L – R is AM–DSB, therefore it perfoms AM modulation. Then, there exists L – R at frequencies below 15 kHz on the signal spectrum and also remains a signal at higher frequencies as will. Since the signal is encoded by dbx, it is expressed by (L – R)' in Fig. 1.
(L – R)' and AUDIO II' are selected and input to SW3 and fed to both LPF and dbx NR circuit, where the residual signal at high frequency is eliminated by the L–R/AUDIO II LPF. Since L–R is provided with dbx NR, a dbx NR decoder is connected between pins ㉔ and ㉗ of IC401. After that, it is input to matrix as L – R (SUB).

C. AUDIO II

AUDIO II is an FM signal with 5 fH as carrier, shown in Fig. 1. First of all, only the AUDIO II signal is picked up by the use of a B.P.F. of 5 fH. It is then subjected to FM detection and is input to SW3. After that, it is used in combination with L – R. AUDIO II' in the fig. 2 is an AUDIO II signal encoded by dbx.

D.

Other than these, there are mode discrimination circuit. Stereo is discriminated by detecting the amplitude of the pilot signal. AUDIO II is discriminated by detecting the carrier of 5 fH. VCO generates 4 fH by a PLL loop, and it is frequency-divided by a flip-flop to create 2 fH. fH ∠ 90°, fH ∠ 0°. 2 fH is used for AM detection, fH ∠ 90° is for the PLL loop, and fH ∠ 0° is used to pick up the pilot signal. The regulator generates 6.7V and 5.2V to supply the power to each circuit of the IC, and also delivers 6.7V output to pin ⑨ of the IC401 where it is used as adjusting voltage.
L + R and L – R are separated into L and R by matrix, and are input to SW1 and SW2. SW1 and SW2 are used to switch the outputs of ㉓ L and ㉒ R to L + R, AUDIO II MUTE, L or R by mode selection terminals.



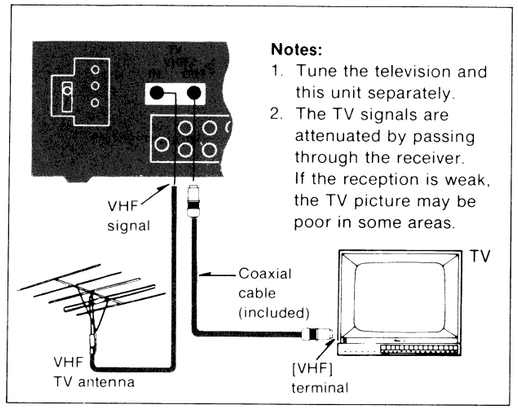
[Fig. 2]

■ CONNECTIONS FOR TV BROAD CASTS

Accessories such as cables, splitters, outdoor antennas etc., may be purchased separately at a local electronics supply store.

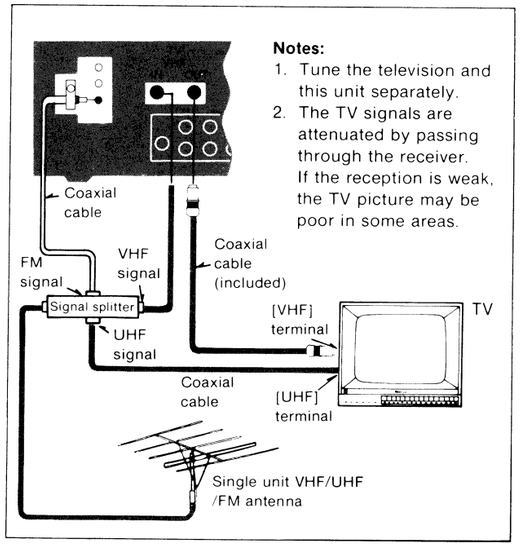
When using a regular TV system

■ When using an VHF TV antenna



Notes:
1. Tune the television and this unit separately.
2. The TV signals are attenuated by passing through the receiver. If the reception is weak, the TV picture may be poor in some areas.

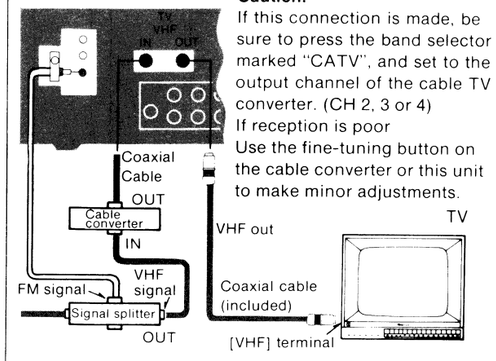
■ When using a single unit VHF/UHF/FM antenna



Notes:
1. Tune the television and this unit separately.
2. The TV signals are attenuated by passing through the receiver. If the reception is weak, the TV picture may be poor in some areas.

When using a cable TV system

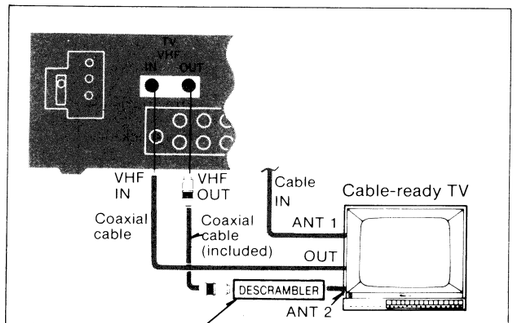
■ If your TV has a standard tuner (not cable ready)



Caution:
If this connection is made, be sure to press the band selector marked "CATV", and set to the output channel of the cable TV converter. (CH 2, 3 or 4)
If reception is poor
Use the fine-tuning button on the cable converter or this unit to make minor adjustments.

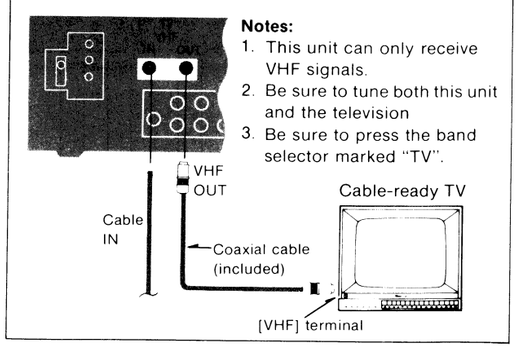
Note:
When cable TV and cable FM are connected simultaneously and cable FM sound is heard through cable FM, the TV image may be blurred depending on the channel. If so, switch the band selector to "CATV".

■ If your TV is cable ready and has a selectable antenna input (ANT 1 and ANT 2)



This cable is only necessary when listening to "premium" channels that require a descrambler.

■ If your TV is cable ready



Notes:
1. This unit can only receive VHF signals.
2. Be sure to tune both this unit and the television
3. Be sure to press the band selector marked "TV".

■ OPERATION

Automatic memory presetting

The FM broadcasting stations may be automatically preset to "channels" 1 through 16 when AM is automatically preset, the FM stations in "channels" 9 through 16 will be replaced by the new AM stations.

❷ Press the "FM" or "AM" button.

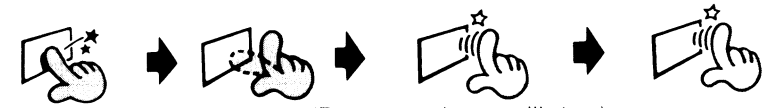
❶ "tuner" (▮→ ▬)

❸ • To preset FM broadcasting stations: Set to 87.9 MHz.
• To preset AM broadcasting stations: Set to 530 kHz.

① Press the button and hold slightly (frequency will change continuously).

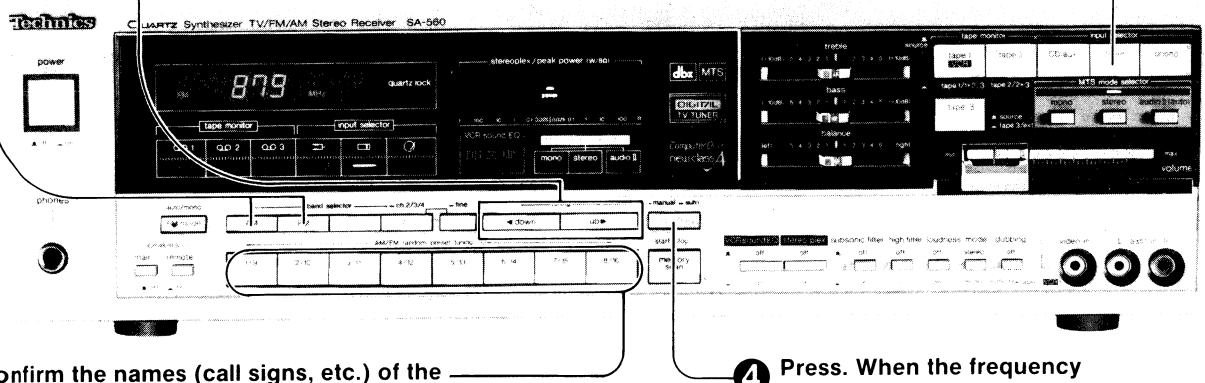
② Release it at 87.9 MHz for FM or 530 kHz for AM, and then press the button again momentarily (frequency change will stop).

③ Press the button momentarily (frequency will change each time the button is pressed), and tune to one of the above frequencies.



(Frequency will change continuously.)

(Frequency change will stop.)

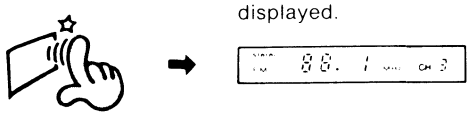


❺ Confirm the names (call signs, etc.) of the broadcasting stations which are preset to each channel, and enter them on the file sheet

• To check the "front" channels (CH 1~ 8):

Press momentarily.

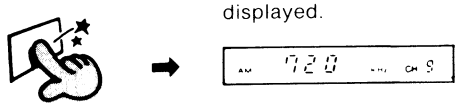
The frequency in the memory and the channel number are displayed.



• To check the "back" channels (CH 9~ 16):

Press slightly longer.

The frequency in the memory and the channel number are displayed.



❹ Press. When the frequency indication begins to change, release.

The frequency will change upward, and the automatic presetting will begin with the next broadcasting station.
It will continue to preset the following consecutive broadcast stations.

Notes:

1. For automatic presetting in areas where there are fewer than 16 FM stations, the remaining channels (through channel 16) will be left unused. The unused channels can be preset by using manual memory presetting.
2. If a new broadcasting station is preset to a channel, the broadcasting station which was previously preset to that channel will be automatically erased.

■ PROTECTION CIRCUITRY

The protection circuitry may have operated if either of the following conditions is noticed:

- No sound is heard when the power is turned on.
- Sound stops during a performance.

The function of this circuitry is to prevent circuitry damage if, for example, the positive and negative speaker connection wires are "shorted", or if speaker systems with an impedance less than the indicated rated impedance of the amplifier are used.

If this occurs, follow the procedure outlines below:

1. Turn off the power.
2. Determine the cause of the problem and correct it.
3. Turn on the power once again after one minute.

Note:
When the protection circuitry functions, the unit will not operate unless the power is first turned off and then on again.

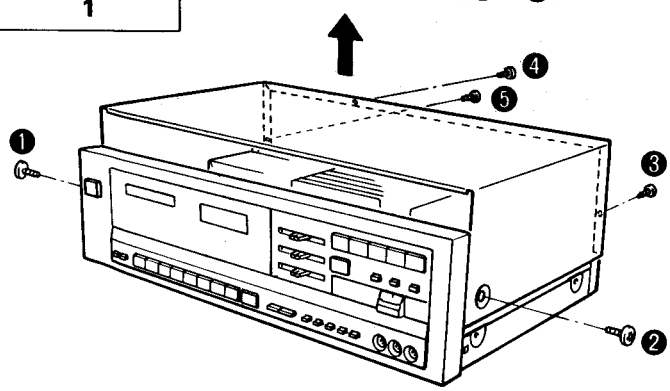
■ BEFORE REPAIR AND ADJUSTMENT

1. Turn off the power supply. Using a 10Ω, 5W resistor, short-circuit both ends of power supply capacitors (C703, C704) in order to discharge the voltage.
2. Before turning the power supply on, after completion of repair, slowly apply the primary voltage by using a power supply voltage controller to make sure that the consumed current at 60 Hz/50 Hz in no-signal mode is shown with respect to supply voltage 110V/127V/220V/240V.

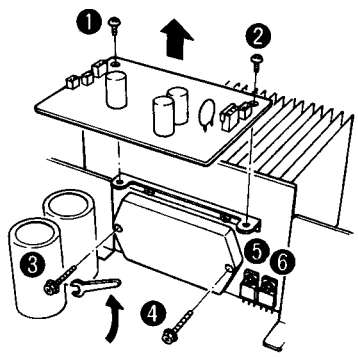
Power supply voltage	AC 110V	AC 127V	AC 220V	AC 240V
Consumed current	300 ~ 700 mA	300 ~ 600 mA [PA], [PE], [PC] 250 ~ 550 mA [M], [MC]	150 ~ 400 mA	150 ~ 350 mA

■ DISASSEMBLY INSTRUCTION

Ref. No. 1	How to remove the cabinet
Procedure 1	1. Remove the 5 screws (❶ ~ ❺)

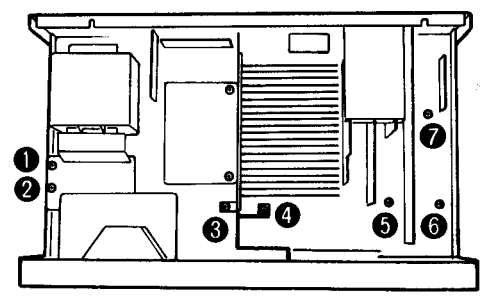


Ref. No. 3	How to remove the power IC and regulator transistor
Procedure 2 ➡ 3	1. Unsolder the power IC or regulator transistor. 2. Remove the 6 screws. (❶ ~ ❻)

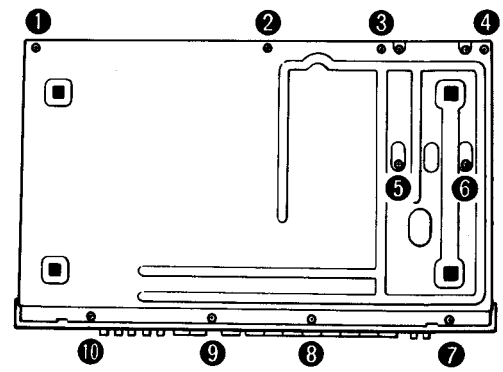


- When mounting the power IC.
  IC apply silicone compond (SZZ0L15) to the rear side of power IC.

Ref. No. 2	How to remove the bottom board
Procedure 2	1. Remove the 7 screws. (❶ ~ ❼)

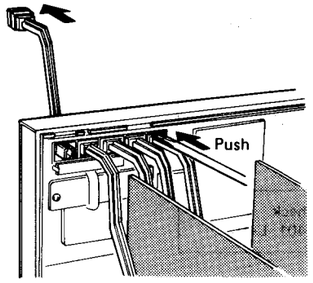


2. Remove the 10 screws. (❶ ~ ❿)

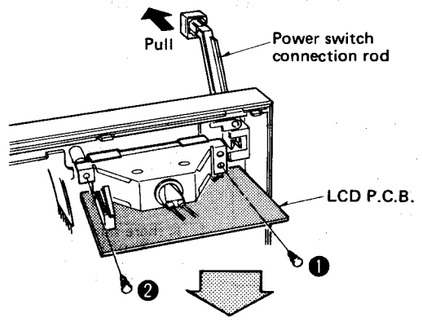


Ref. No. 4	How to remove the front panel
Procedure 2➡4	

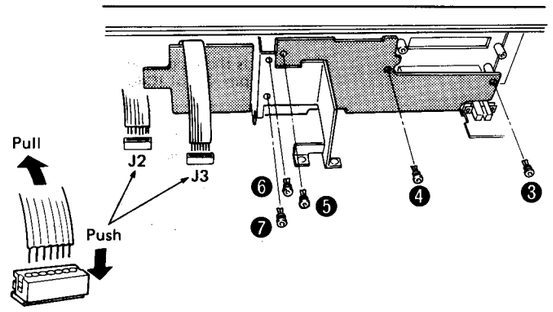
1. Remove the 5 connection rods.



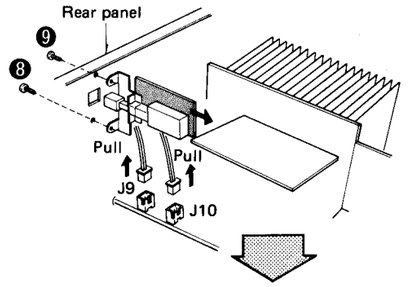
2. Remove the 2 rivets of LCD P.C.B. (❶, ❷).
3. Remove the power switch connection rod.



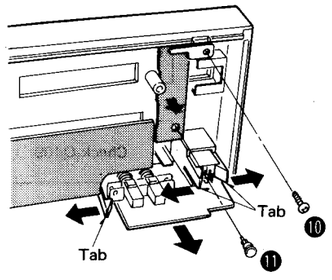
4. Remove the 2 lead wires (J2, J3) and 5 rivets (❸~❼)

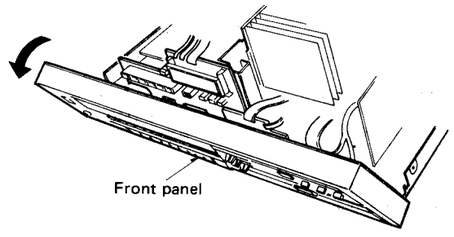


5. Remove the 2 screws of speaker impedance P.C.B. (❽, ❾) pull the 2 connection (J9, J10).

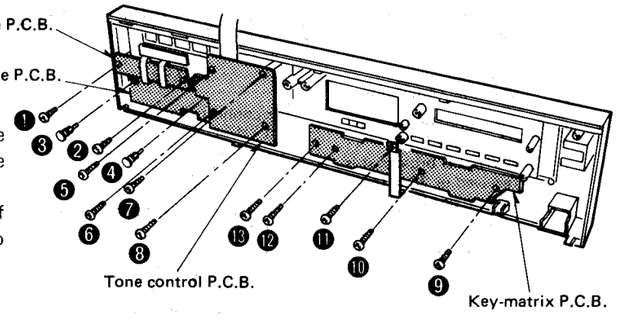


6. Remove the screw (❿) and rivet. (⓫)
7. Release the 3 tabs of speaker selector P.C.B. aside



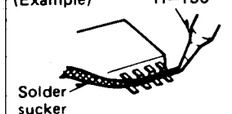
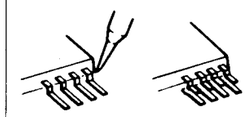
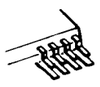


Ref. No. 5	How to remove the tone control P.C.B., key-matrix P.C.B., volume P.C.B. and mode P.C.B.
Procedure 1➡2➡4➡5	



1. Remove the 2 screws of mode P.C.B. (❶, ❷).
2. When removing the tone control P.C.B., set the tape monitor selector of tape 3 to source (▮) and remove the 4 screws of tone control P.C.B. (❺~❽). (Removing the P.C.B. with the tape monitor selector of tape 3 set at "tape 3/ext" (▬) will cause the switch to be damaged.)
3. Remove the 2 rivets of volume P.C.B. (❸, ❹).
4. Remove the 5 screws of key-matrix P.C.B. (❾~ ⓭).

■ HOW TO REPLACE IC'S (Small outline type)

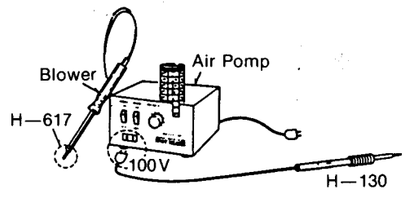
	Replacing procedure		Cautions
1	Reduce the amount of solder on each pin of the integrated circuit by use of a solder sucker.	(Example) H—130 	● **Recommended tool** .....Special soldering iron *H605M and H—130. *H605E and H—130. ● Do not touch the soldering iron to the area for a long time. It may otherwise cause removal of the print foil. ● When shifting the pin upward, do the job quickly while the solder is melting. If the solder is hard, it may cause removal or breakage of the print foil. ● When using a pencil type soldering iron. 1. Completely remove the solder from each IC pin by use of solder sucker. 2. Raise each pin by means of an eyeleteer, hold the pliers then remove IC package from P.C.B.
2	Melt the solder on the pin (one electrode) with the soldering iron.		
3	While the solder is melting, shift the pin upward by the soldering iron to remove it from the foil.		
4	Remove each pin from the foil according to the above-mentioned procedure.		

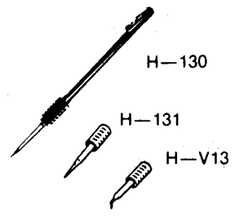
*** Special soldering iron**
(Refer to Technical Information, ORDER NO. GAD84125486T1)...For U.S.A. and Canada
(Refer to Technical Information, ORDER NO. GAD84115476T8)...For others

- **H—605 Spot Heater (hot-air solder iron)**

This device that uses hot air to melt solder was developed to remove Flat-Pakage ICs, RHCs and chip parts.

- H—605M (For 120V power source)
- H—605E (For 200V/220V/240V power source)





- **H—617 Twin Nozzle (for spot heater)**

Special nozzle for the removal of RHCs and chip resistors. (Nozzle diameter : 1.0 mm x 2)

- **H—130 Slim Pencil Solder Iron**

An ultrasmall ceramic heater solder iron is extremely handy for soldering chip parts, RHCs, ICs, etc., to high-density circuit boards.
Features:

● Rated power:	100V, 15W
● Max. temp.:	400°C
● Heater:	ceramic (long life)
● Insulation resistance:	100MΩ
● Length:	178 mm
● Weight:	16 g (not including cord)

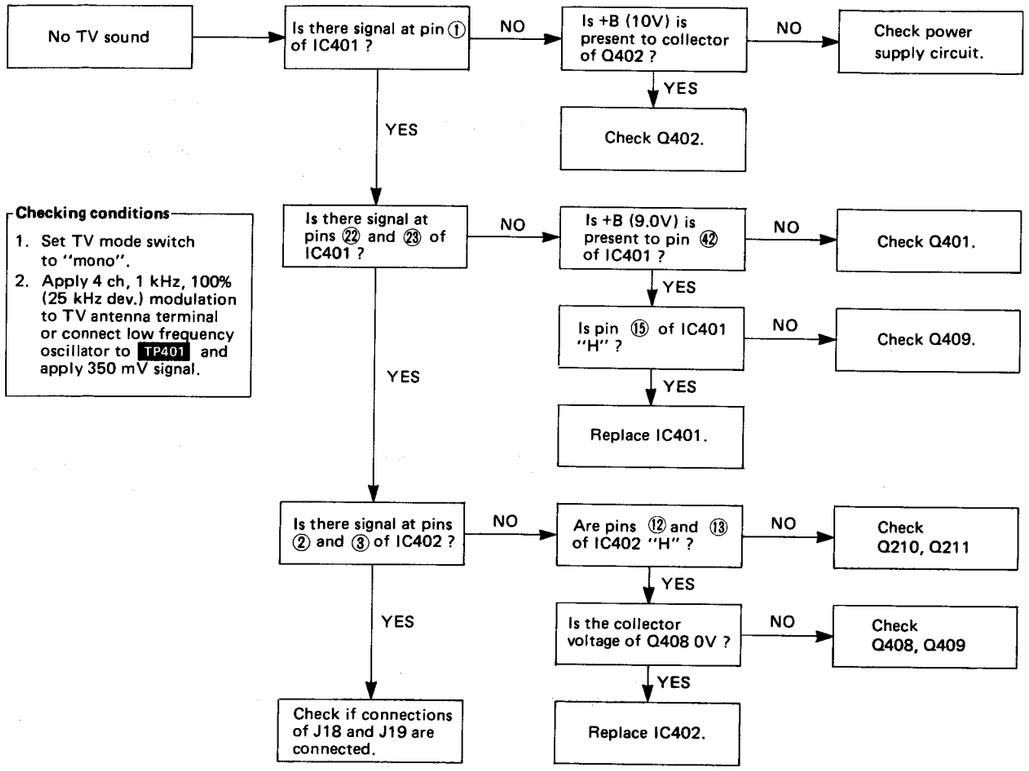
- **H—131, H—V13 Cap Bits**

Solder tip for the slim pencil Solder Iron and is composed of a bit holder and a corrosion resistance solder tip.
Permits changing of solder tips even while still hot.

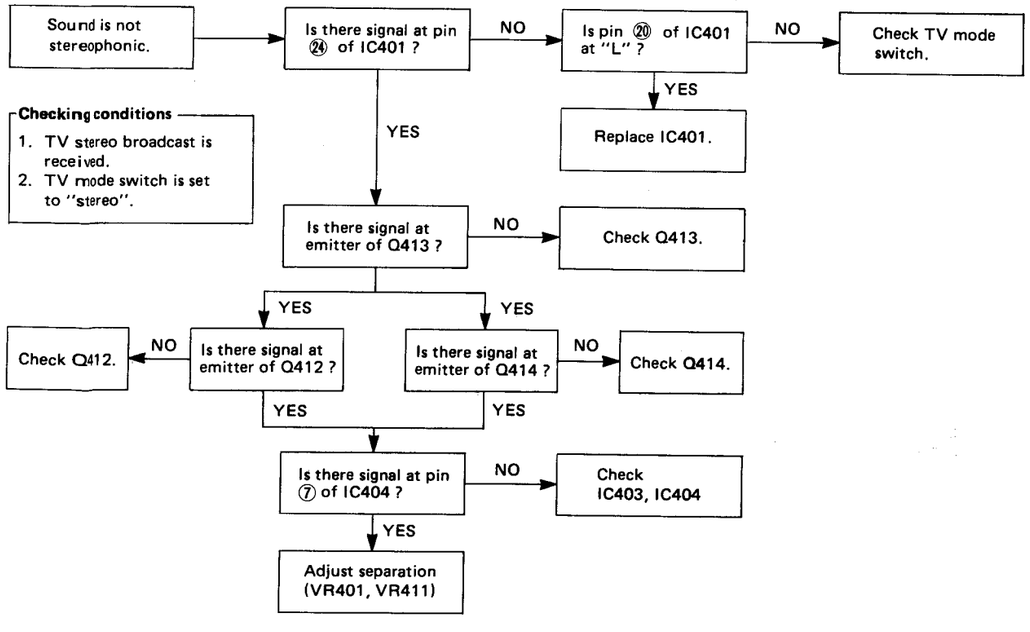
● Solder tip:	0.3 mm

■ TROUBLE SHOOTING GUIDE

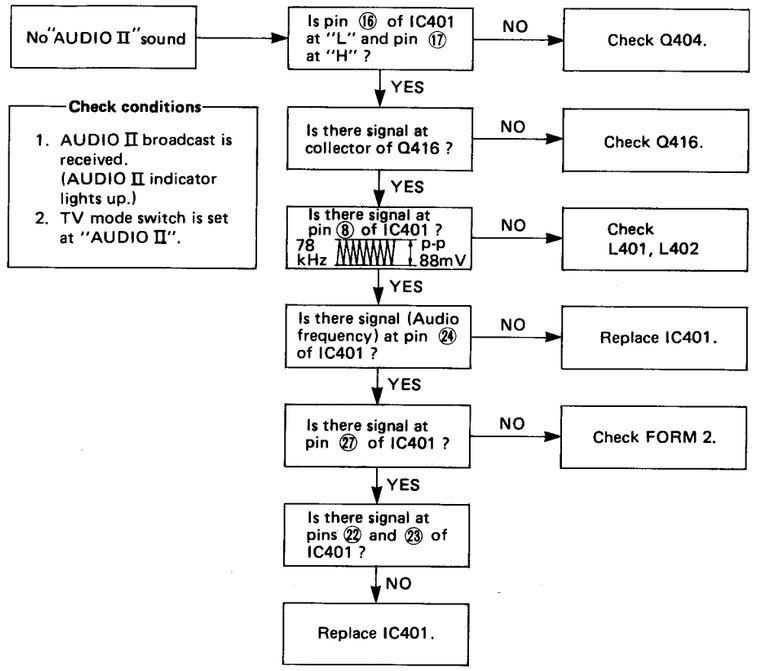
SYMPTOM 1: No TV sound



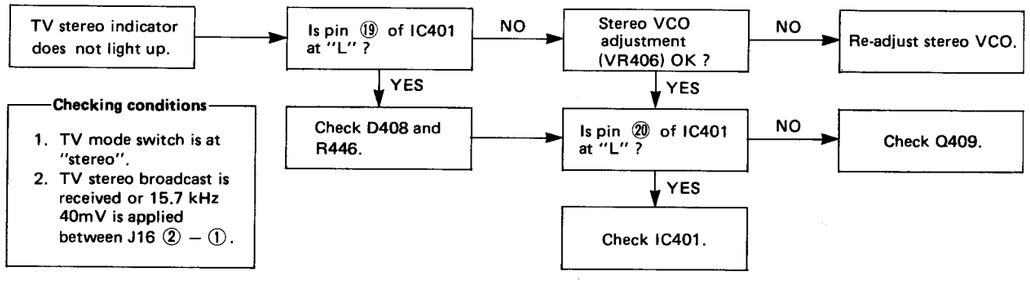
SYMPTOM 2: Sound is not stereophonic.



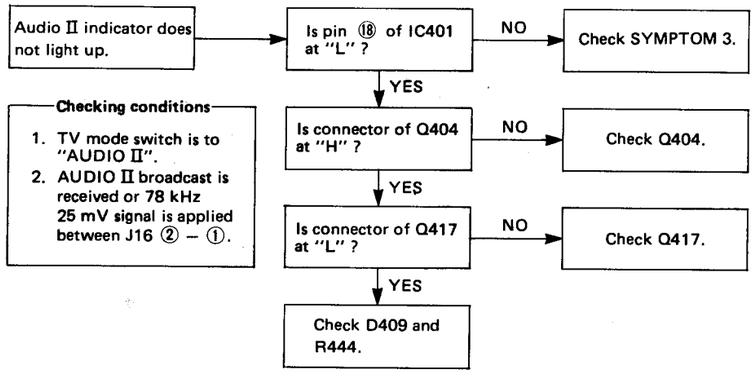
SYMPTOM 3: No "AUDIO Ⅱ" sound



SYMPTOM 4: TV stereo indicator does not light up.



SYMPTOM 5: Audio Ⅱ indicator does not light up.



■ MEASUREMENTS AND ADJUSTMENTS

• AM/FM/TV

Control positions and equipment used

- AM and FM signal generator (AM and FM-SG).
- TV signal generator (TV-SG)
- Stereo modulator
- Distortion analyser
- Oscilloscope
- AC and DC electronic voltmeter (EVM)
- Frequency counter
- Choke coil (100μH)
- Resistor (100kΩ)
- Ceramic capacitor (200pF)

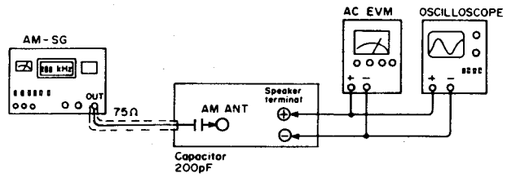
Note: For **T203** (AM-IFT) and **L202** (AM OSC coil), adjusted parts are supplied. So, do not turn the cores of these parts.

AM-RF ADJUSTMENT

1. Test equipment connection is shown in figure.
2. Set the unit to "**AM**" position.
3. Place the radio frequency display and signal generator setting to **610 kHz**.
4. Adjust **L201** for maximum output.
5. Place the radio frequency display and signal generator setting to **1500 kHz**.
6. Adjust **CT201** for maximum output.
7. Repeat steps 3 ~ 8.

Note: Antenna input level must be as low as possible being free from AGC.

AM SIGNAL GENERATOR CONDITION
Modulation 30%
Modulation frequency..... 400 Hz

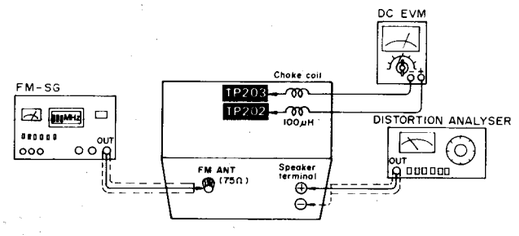


FM MONO DISTORTION ADJUSTMENT

1. Test equipment connection is shown in figure.
2. Set the unit to "**FM**" position.
3. Place the radio frequency display and signal generator setting to **100.10 MHz**.
4. Adjust **T201** core so that voltage measured in signal mode is **0 mV (0 ± 50 mV)** in 300 mV range.
5. Adjust **T202** so that the distortion factor of L ch is minimized.
6. Repeat steps 4 and 5 a few times.
7. Make sure that the distortion factors of L ch and R ch are nearly the same with each other.

Note: The adjusting screwdriver used should be made of resin.

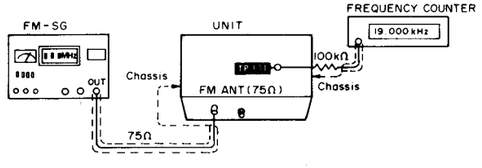
FM SIGNAL GENERATOR CONDITION
Modulation.....100%
Modulation frequency..... 400 Hz
Output level..... 66 dB



FM STEREO ADJUSTMENT (FREE RUN)

1. Test equipment connection is shown in figure.
2. Set the unit into "**FM auto**" position. (by FM mode select button).
3. Place the radio frequency display and signal generator settint to **100.10 MHz**.
4. Adjust **VR301** for **19 kHz ± 30 Hz** on frequency counter reading.

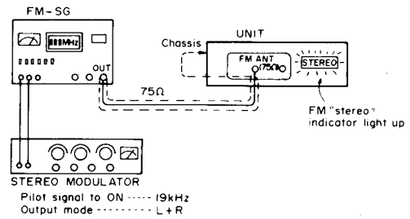
FM SIGNAL GENERATOR CONDITION
Modulation 0
Modulation frequency..... 0
Output level..... 66 dB

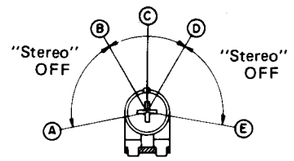


USING ALTERNATE SYSTEM

1. Apply stereo signal from generator or receive the stereo broadcast.
2. Adjust **VR301** until stereo indicator light up. Cement arm of **VR301** as shown figure.

FM SIGNAL GENERATOR CONDITION
Modulation..... 10%
Modulation frequency..... Pilot (19 kHz)
Output level..... 66 dB



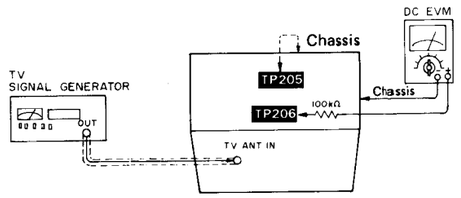


VR301

Ⓐ – Ⓑ, Ⓓ – Ⓔ.... "Stereo" OFF position
Ⓑ – Ⓓ..... "Stereo" ON position (Indicator lighting)
Ⓒ..... Adjust point of pilot circuit

TV VCO ADJUSTMENT

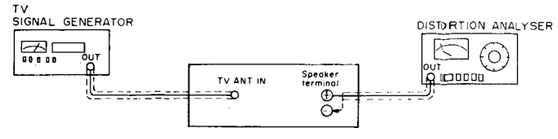
1. Test equipment connection is shown in figure.
2. Set the unit to "**TV**" position.
3. Make it no-signal, and connect **TP205** to the chassis earth.
4. Receive a TV CH4 signal.
5. Make **TP205** open, then adjust **L203** so that the value of DC EVM is the same as in no-signal mode.



TV-SG CONDITION
Frequency..... CH4
Modulation..... Video : OFF, Audio : 1 kHz (25 kHz deviation)
Output level..... 66 dB

TV DISTORTION ADJUSTMENT

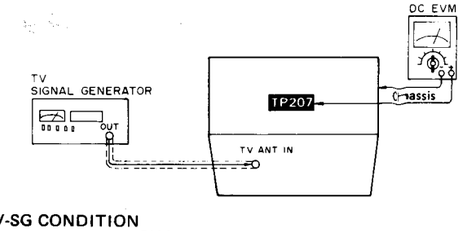
1. Test equipment connection is shown in figure.
2. Set the unit to "**TV**" position.
3. Receive a TV CH4 signal.
4. Adjust **T205** so that the distortion is minimized.



TV-SG CONDITION
Frequency..... CH4
Modulation..... Video : OFF, Audio : 1 kHz (25 kHz deviation)
Output level..... 66 dB

AFC ADJUSTMENT

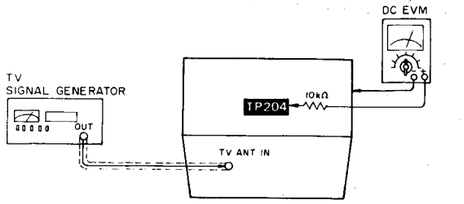
1. Test equipment connection is shown in figure.
2. Set the unit to "**TV**" position.
3. Receive a TV CH4 signal.
4. Adjust **T204** for **7.0V ± 0.2V**.



TV-SG CONDITION
Frequency..... CH4
Modulation..... Video : OFF, Audio : 1 kHz (25 kHz deviation)
Output level..... 66 dB

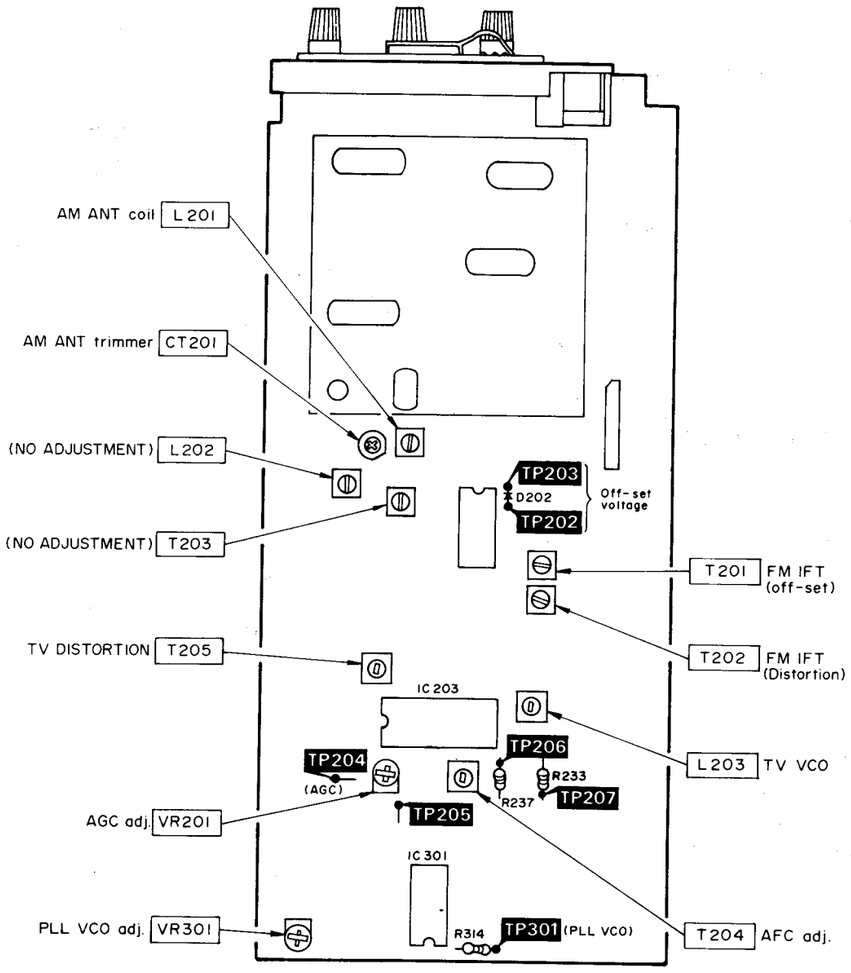
AGC ADJUSTMENT

1. Test equipment connection is shown in figure.
2. Set to "**TV**" position.
3. Adjust **VR201** for **1.7V ± 0.1V**.



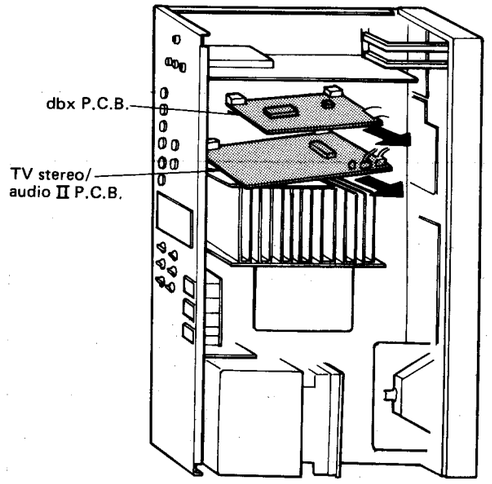
TV-SG CONDITION
Frequency..... CH7
Modulation..... Video : OFF, Audio : 1 kHz (25 kHz deviation)
Output level..... 96 dB

- **Adjustment points**

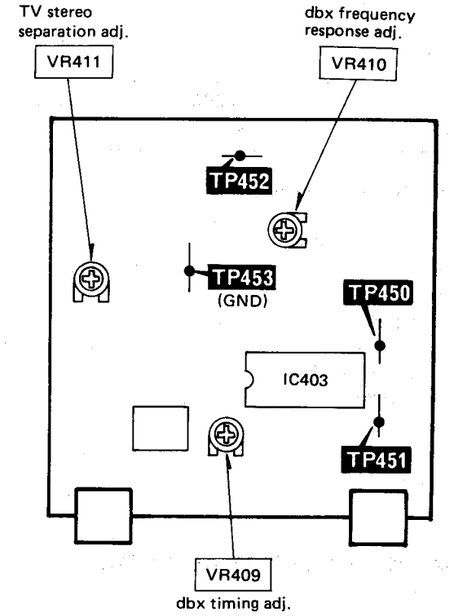


- **TV stereo/audio II**

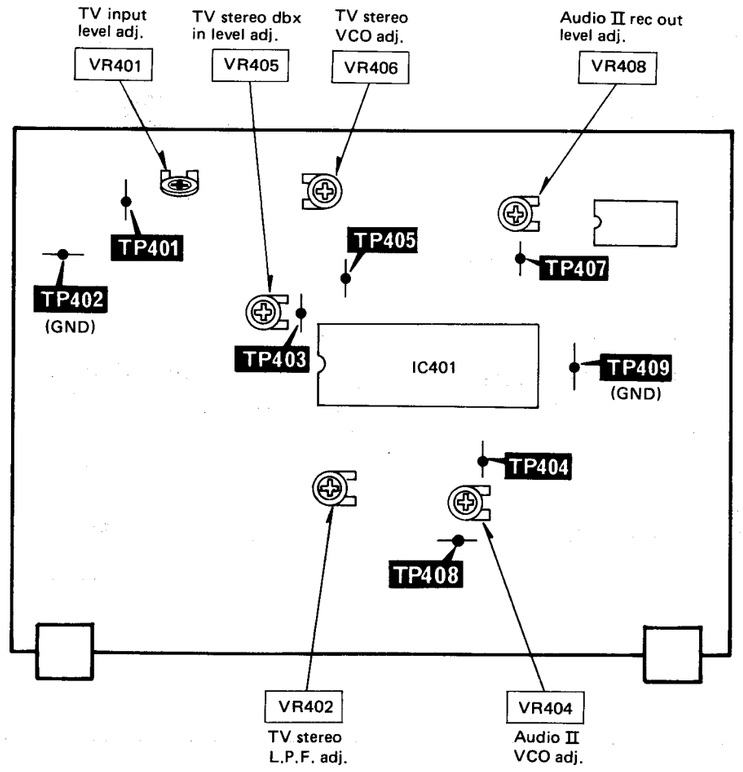
Note: 1. When adjusting, remove TV stereo/audio II P.C.B. and dbx P.C.B. from the main P.C.B. (Take care not to short-circuit the P.C.B.)
2. If the (IC401 ~ IC404) and other parts used in TV stereo/audio II circuit are replaced, it is necessary to perform all the adjustments(A ~ I).



- **Adjustment point dbx circuit P.C.B.**

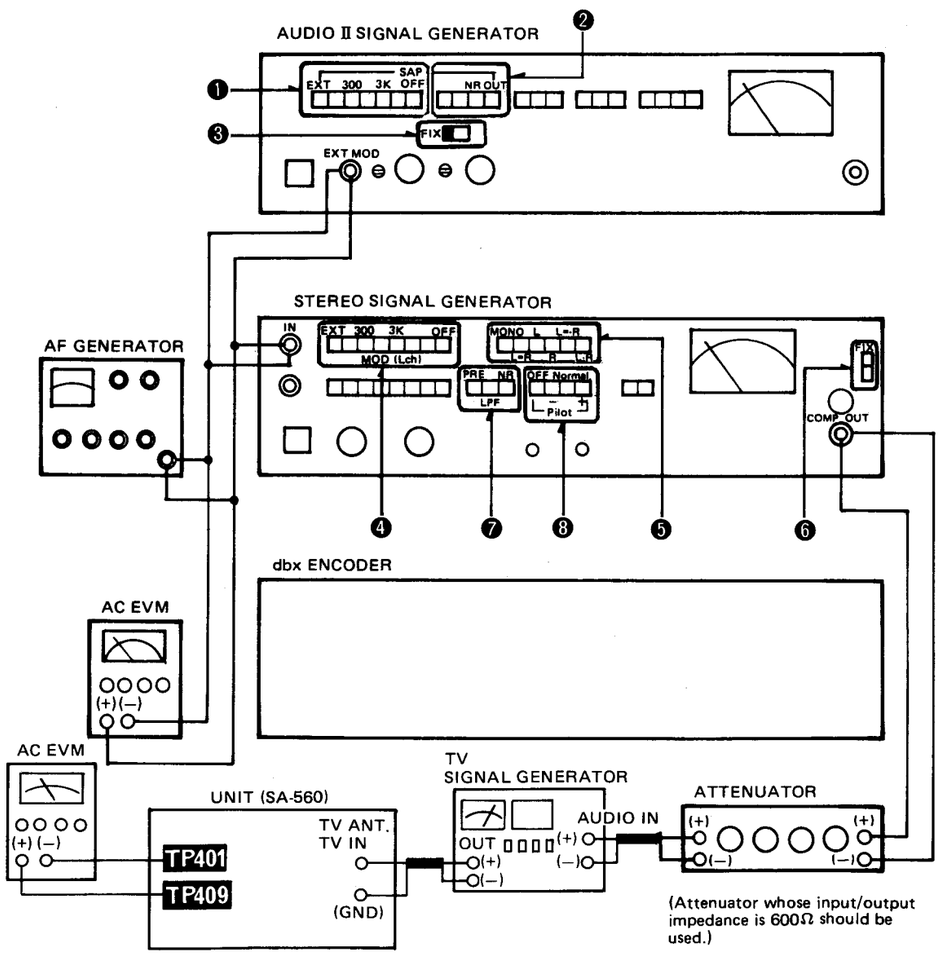


TV stereo/audio II circuit P.C.B.



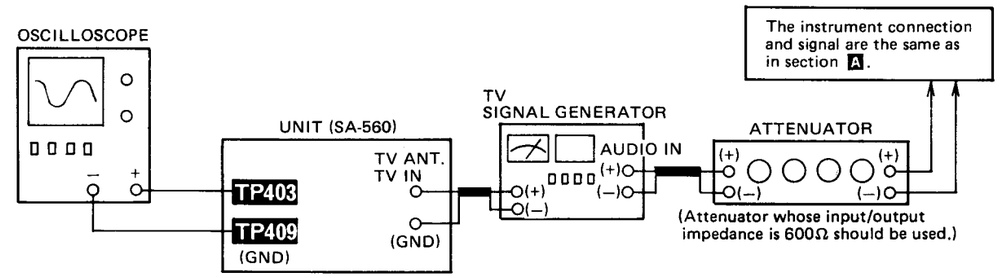
A Adjustment of input level

1. Test equipment connection is shown in figure.
2. Set the multiplex TV sound mode selector to "**stereo**".
3. Apply **1 kHz, 0 dBm (0.775V)** signal from AF generator to EXT MOD terminal of AUDIO Ⅱ signal generator.
4. Audio Ⅱ signal generator.
   - Press the "**EXT**" (❶) and "**NR**" (❷) buttons of switch.
   - Set the switch ❸ (SAP output level) to "**FIX**".
5. TV stereo signal generator.
   - Press the "**EXT**" button (❹) of switch.
   - Press the "**mono**" button (❺) of switch (MOD selector).
   - Set the switch ❻ (composite output selector) to "**FIX**".
6. Adjust the attenuator so that the TV signal generator is 25 kHz MOD.
7. Apply 4 ch. 60 dB (picture + sound) signal from TV signal generator to TV ANT IN terminal of the set. Then shift the band selector to "**TV**", and receive TV 4 ch.
8. Adjust **VR401** so that the value of AC EVM connected between **TP401** and **TP409** (GND) is **AC 0.35V ± 0.01V**.



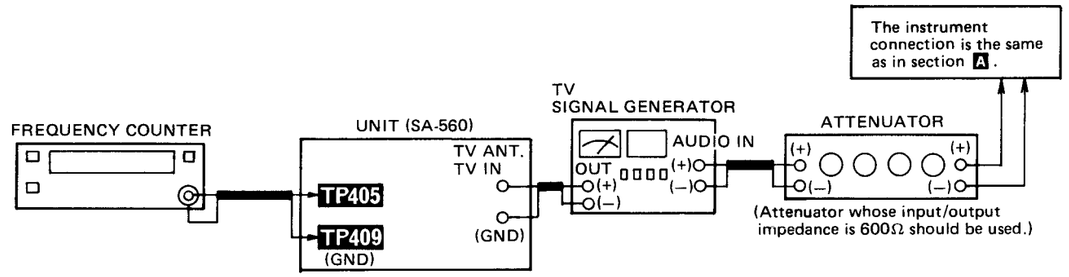
B Adjustment of TV stereo L.P.F.

1. After the adjustment of section A, connect the test equipment as shown in the figure.
2. Audio Ⅱ signal generator.
   - Press the "**OUT**" (❷) button of switch.
3. Stereo signal generator.
   - Press the "**OFF**" (❹) button of switch.
4. Connect an oscilloscope between **TP403** and **TP409** (GND). (Oscilloscope: AC range)
5. Completely turn **VR402** counterclockwise, and then slowly turn it clockwise back to the initial dip position.



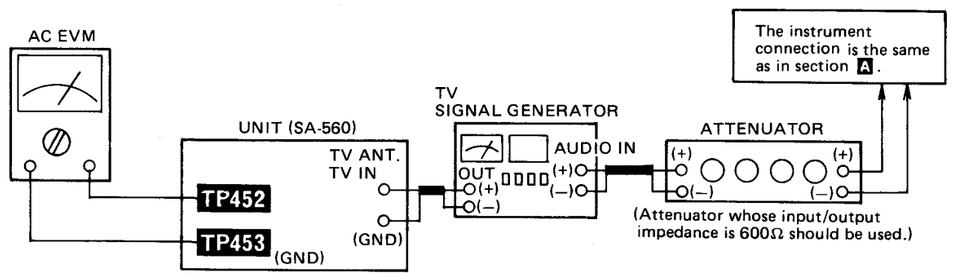
C Adjustment of TV stereo VCO

1. After the adjustment of section B, connect the test equipment as shown in the figure.
2. Audio Ⅱ signal generator.
   - Press the SAP OUT switch (❷) "**OFF**". (To make it non-signal).
3. Connect a frequency counter between **TP405** and **TP409**, (GND). Then adjust **VR406** so that the frequency is **62.94 kHz ± 0.1 kHz**.



D Adjustment of TV stereo dbx in level

1. After the adjustment of section C, connect the test equipment as shown in the figure.
2. Apply **300 Hz, –17 dBm (110 mV)** signal from AF generator to stereo signal generator.
3. Stereo signal generator.
   - Press the "**EXT**" button (❹) of switch.
   - Press the "**L = –R**" button (❺) of switch.
   - Press the "**Normal**" button (❽) of Pilot switch.
4. Connect AC EVM between **TP452** and **TP453**. Then adjust **VR405** so that the voltage is **AC 47 mV ± 0.5 mV**.



enerator.

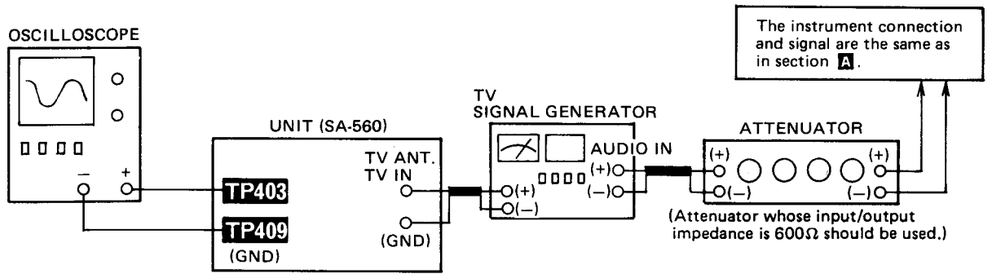
t.

.35V ± 0.01V.

utput
l be

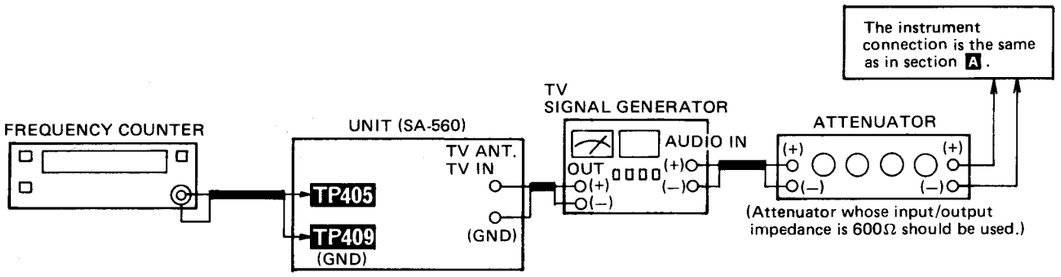
B Adjustment of TV stereo L.P.F.

1. After the adjustment of section A, connect the test equipment as shown in the figure.
2. Audio II signal generator.
   - Press the "**OUT**" (❷) button of switch.
3. Stereo signal generator.
   - Press the "**OFF**" (❹) button of switch.
4. Connect an oscilloscope between **TP403** and **TP409** (GND). (Oscilloscope: AC range)
5. Completely turn **VR402** counterclockwise, and then slowly turn it clockwise back to the initial dip position.



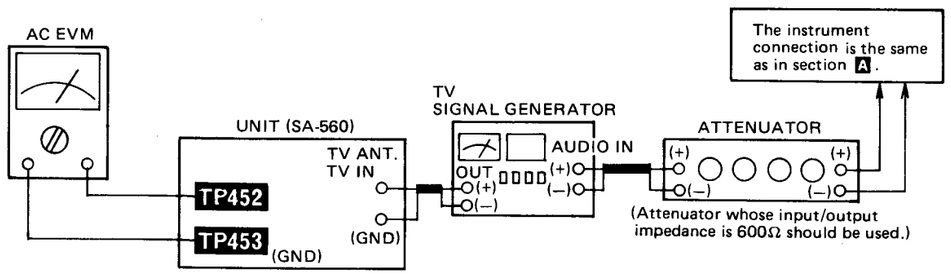
C Adjustment of TV stereo VCO

1. After the adjustment of section B, connect the test equipment as shown in the figure.
2. Audio II signal generator.
   - Press the SAP OUT switch (❷) "**OFF**". (To make it non-signal).
3. Connect a frequency counter between **TP405** and **TP409** (GND).
   Then adjust **VR406** so that the frequency is **62.94 kHz ± 0.1 kHz**.



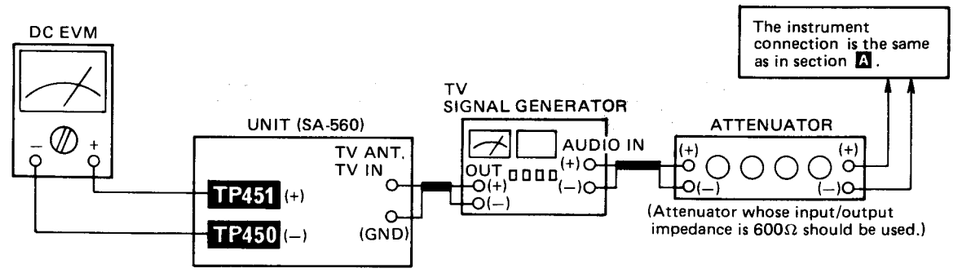
D Adjustment of TV stereo dbx in level

1. After the adjustment of section C, connect the test equipment as shown in the figure.
2. Apply **300 Hz, –17 dBm (110 mV)** signal from AF generator to stereo signal generator.
3. Stereo signal generator.
   - Press the "**EXT**" button (❹) of switch.
   - Press the "**L = –R**" button (❺) of switch.
   - Press the "**Normal**" button (❽) of Pilot switch.
4. Connect AC EVM between **TP452** and **TP453**. Then adjust **VR405** so that the voltage is **AC 47 mV ± 0.5 mV**.



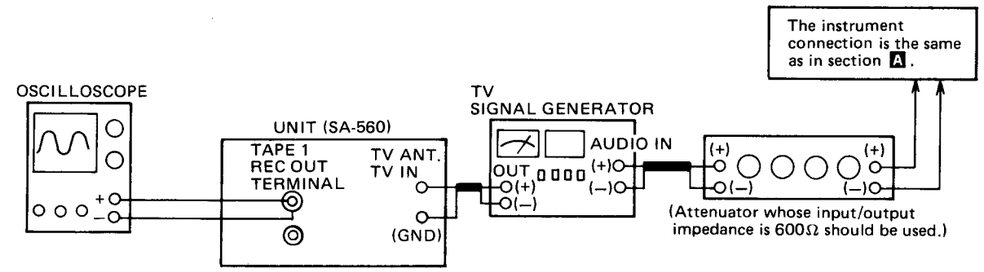
E Timing adjustment of dbx

1. After the adjustment of section D, connect the test equipment as shown in the signal.
2. Connect DC EVM between **TP450** (–) and **TP451** (+). Then adjust **VR409** so that the voltage is **DC 15 mV ± 0.5 mV**.



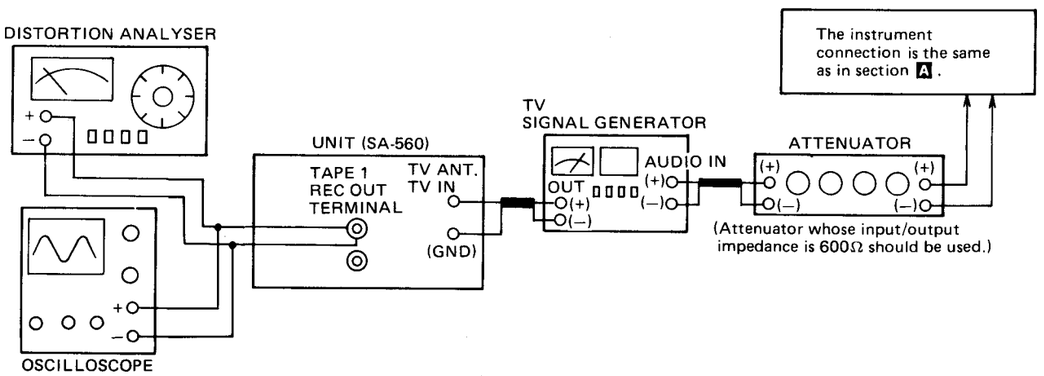
F Adjustment of dbx frequency characteristic

1. After the adjustment of section E, connect the test equipment as shown in the figure.
2. Apply **1 kHz, –17 dBm (110 mV)** signal from AF generator to stereo signal generator.
3. TV stereo signal generator.
   - Press the "**EXT**" button (❹) of MOD switch.
   - Press the "**L = R**" button (❺) of switch.
   - Press the "**Normal**" button (❽) of Pilot switch.
4. Change the modulation frequency from 1 kHz to 2 kHz and connect the oscilloscope to TAPE 1 REC OUT. Then observe the waveform and adjust **VR410** so that the value is the same with 1 kHz and 2 kHz.



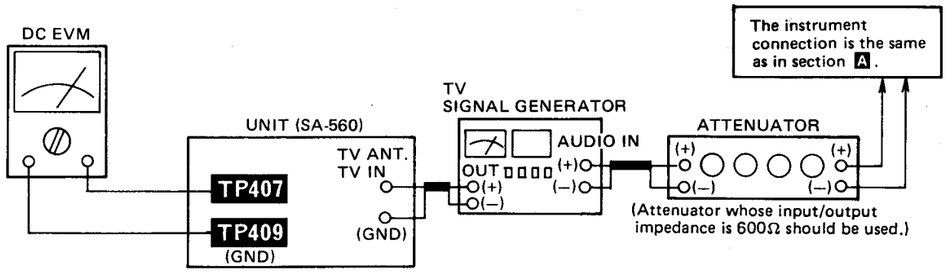
G Adjustment of separation

1. After the adjustment of section F, connect the test equipment as shown in the figure.
2. Apply **2 kHz, –17 dB (110 mV)** signal from AF generator to stereo signal generator.
3. TV stereo signal generator.
   Press the "**L**" button (❺) of switch.
4. Adjust **VR411** so that the leakage from L ch to R ch is minimized.



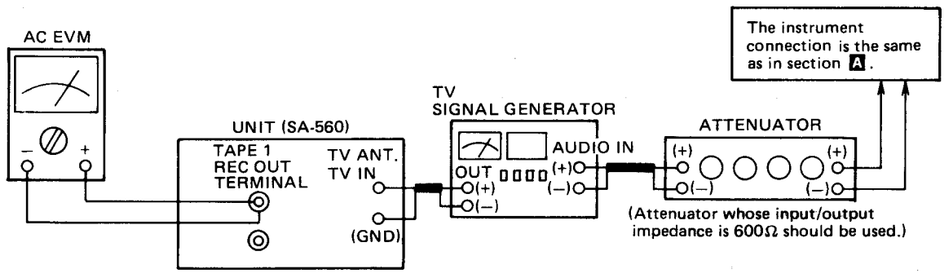
H Adjustment of AUDIO II VCO

1. After the adjustment of section G, connect the test equipment as shown in the figure.
2. Set the multiplex TV sound mode selector to "**audio II**".
3. Audio II signal generator.
   Press the "**OFF**" button (❶) of SAP switch.
   Press the "**OUT**" button (❷) of SAP switch.
4. TV stereo signal generator.
   Press the "**mono**" button of switch.
5. Connect DC EVM between **TP407** and **TP409** (GND); short-circuit **TP404** and **TP408**; then read the voltage on DC EVM. Next, open the circuit of **TP404** and **TP408**, then adjust **VR404** so that the voltage is the same as in short-circuit.

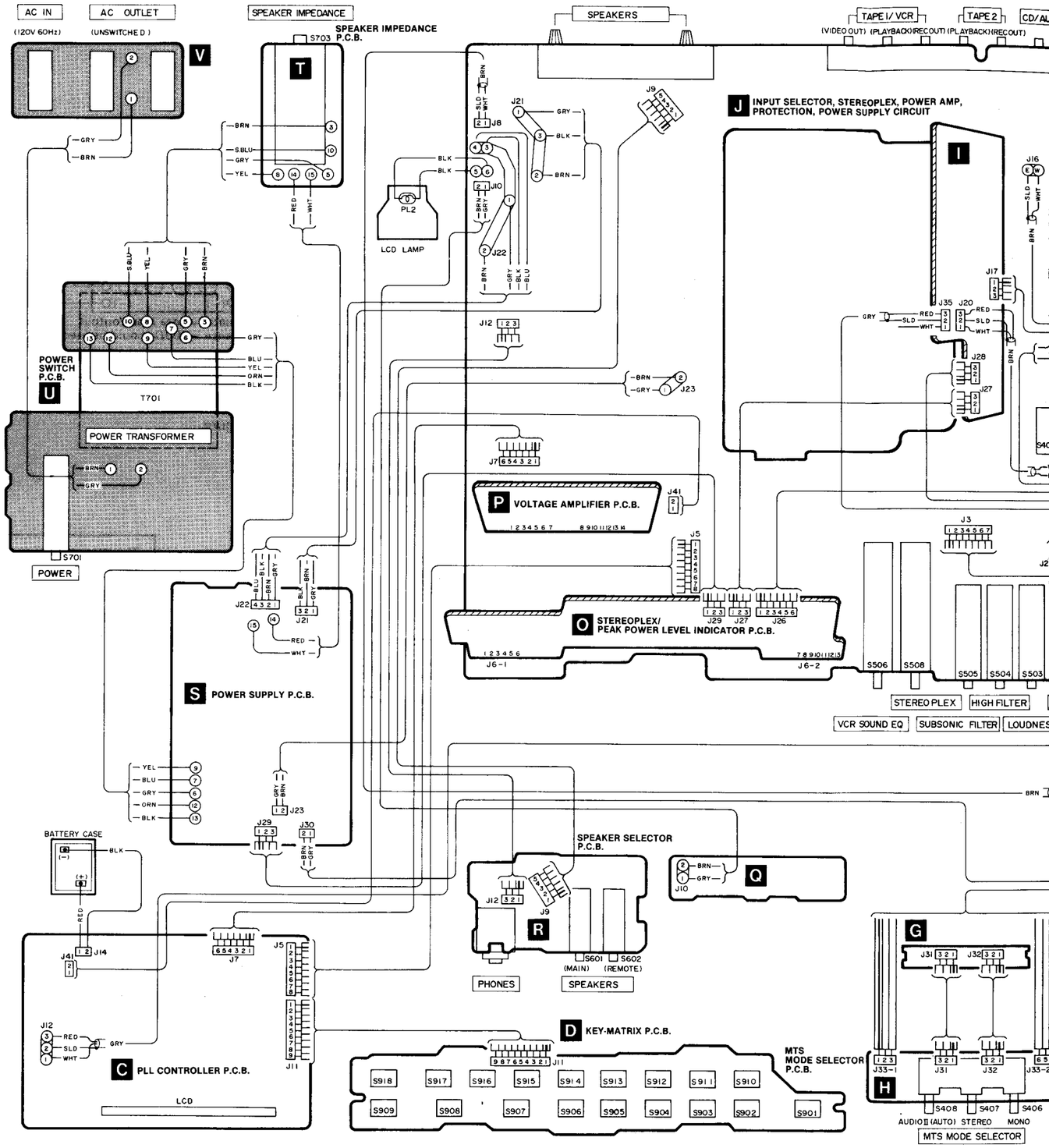


I Adjustment of AUDIO II REC OUT level

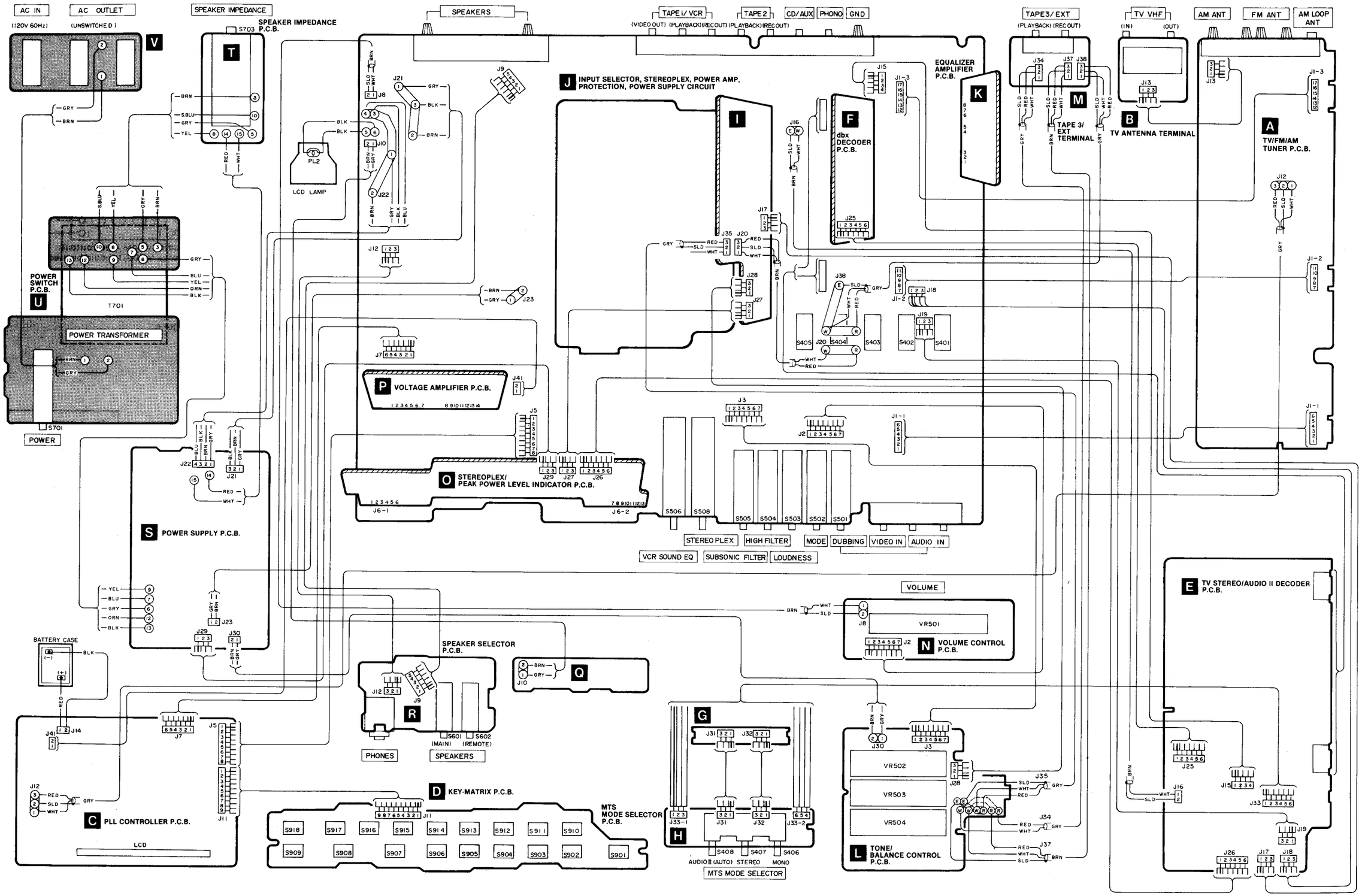
1. After the adjustment of section H, connect the test equipment as shown in the figure.
2. Apply **1 kHz, –10 dBm (245 mV)** signal from AF generator to EXT MOD terminal of AUDIO II signal generator.
3. Audio II signal generator.
   Press the "**EXT**" button (❶) of SAP switch.
4. Adjust **VR408** so that the voltage on AC EVM is **0.3V ± 20 mV.**



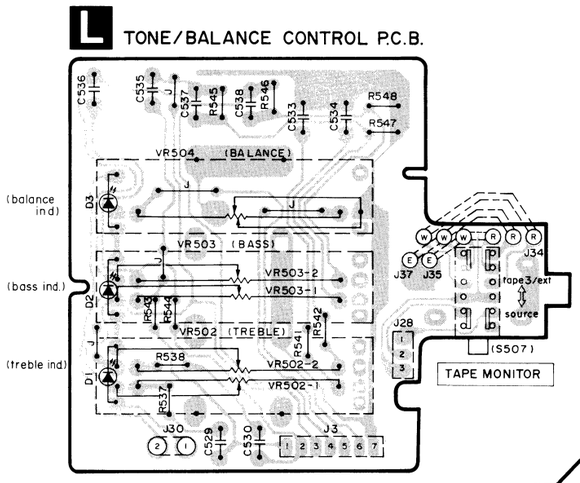
■ WIRING CONNECTION DIAGRAM

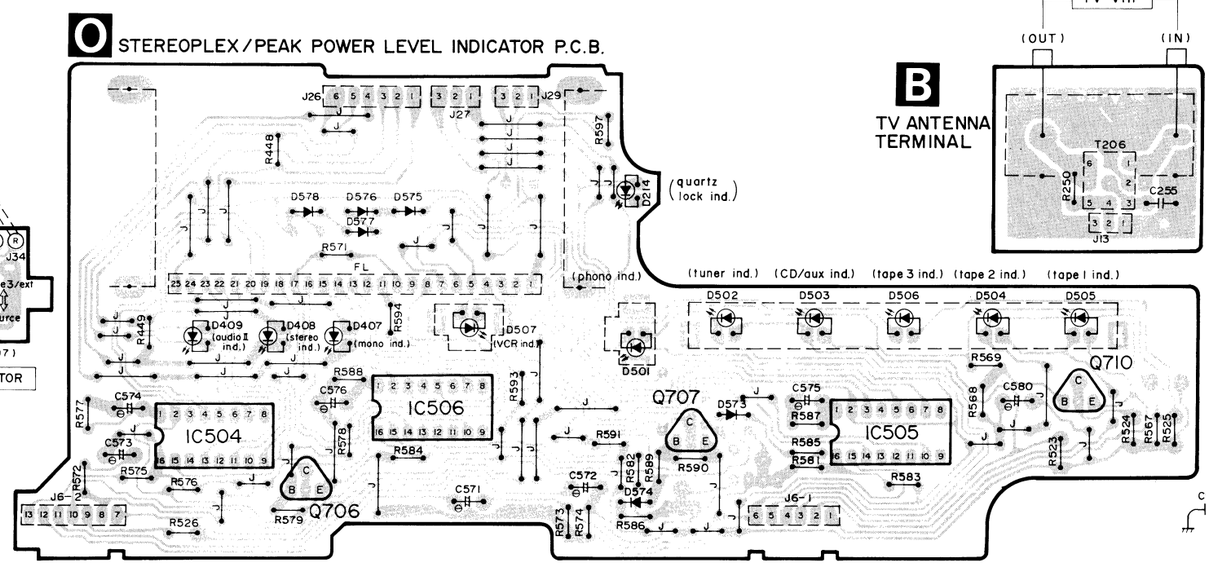


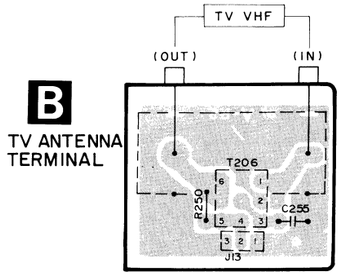
■ WIRING CONNECTION DIAGRAM

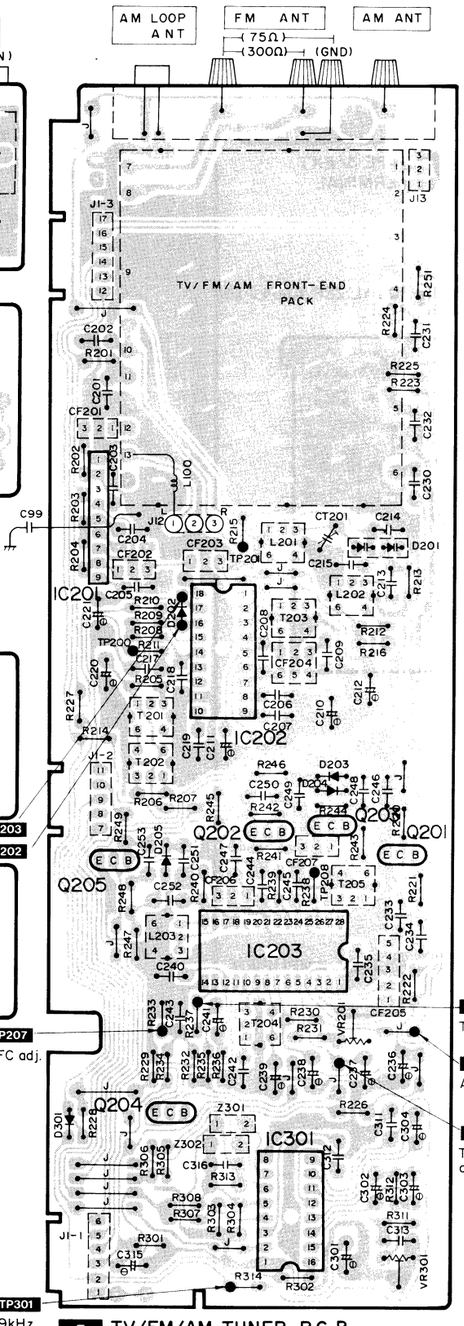


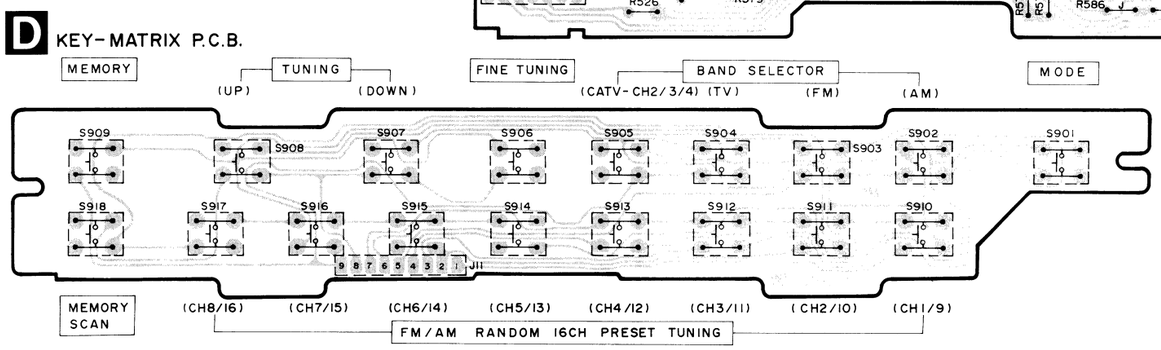
■ PRINTED CIRCUIT BOARDS

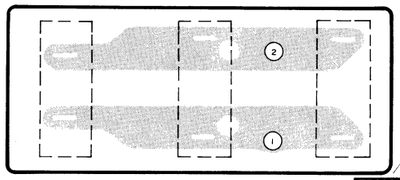


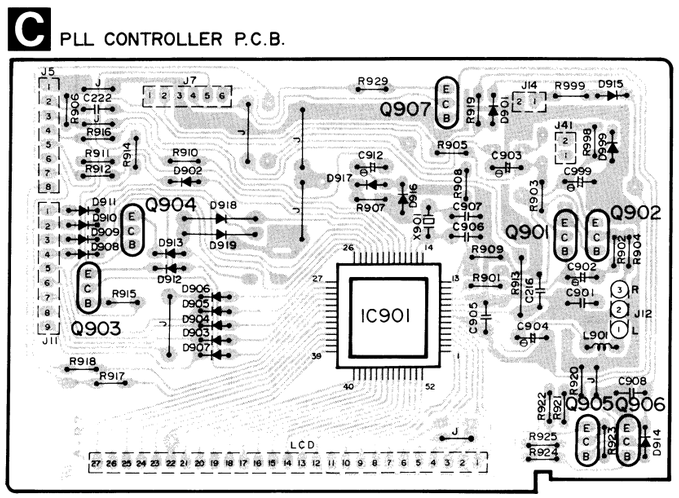


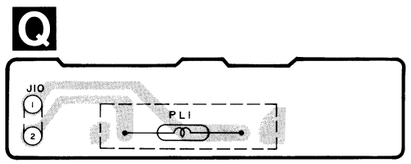


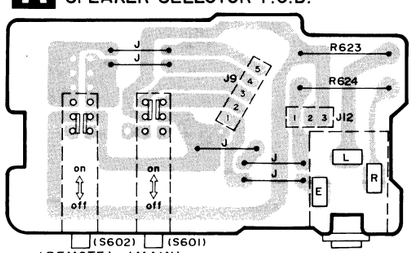


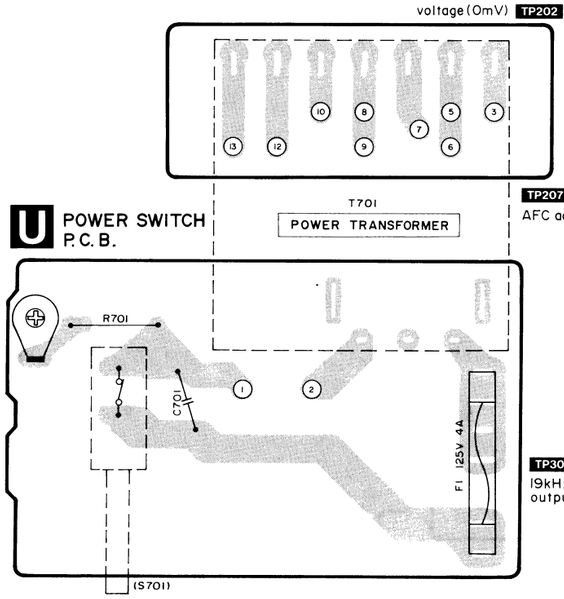




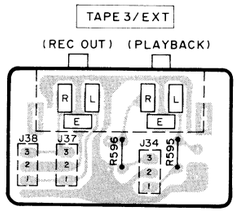




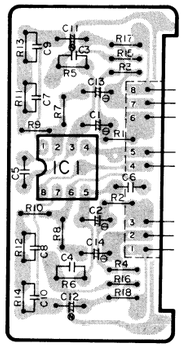




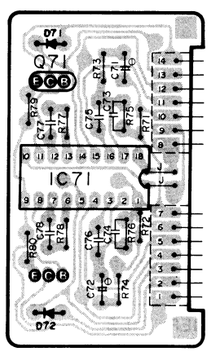
M TAPE 3/EXT TERMINAL



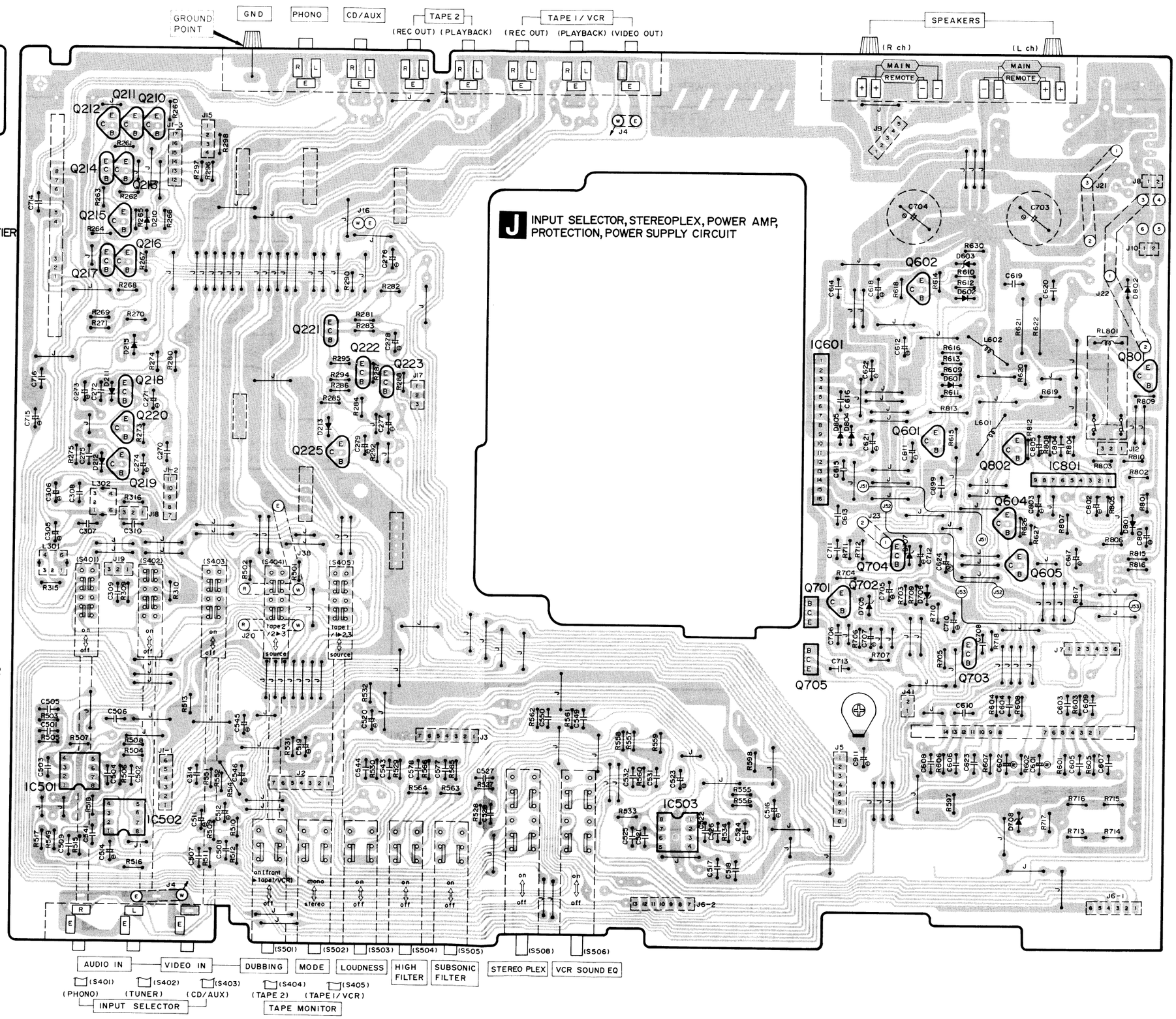
K EQUALIZER AMPLIFIER P.C.B



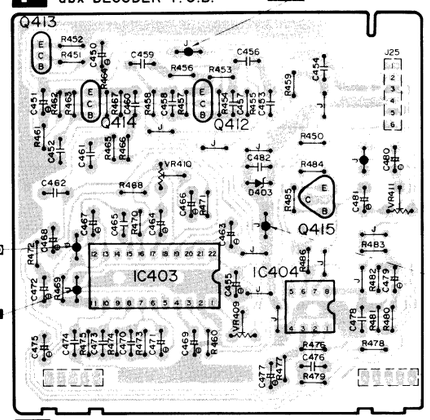
P VOLTAGE AMPLIFIER P.C.B



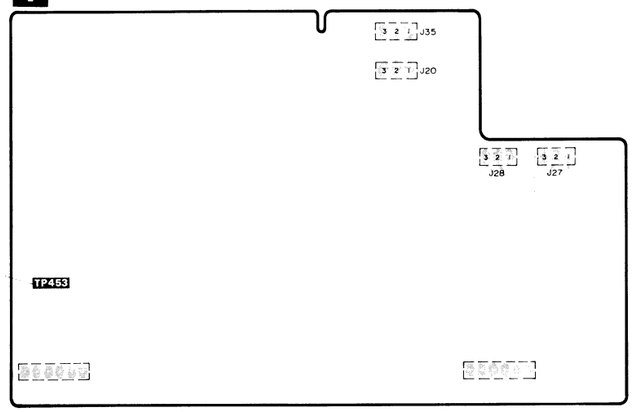
J INPUT SELECTOR, STEREOPLEX, POWER AMP, PROTECTION, POWER SUPPLY CIRCUIT



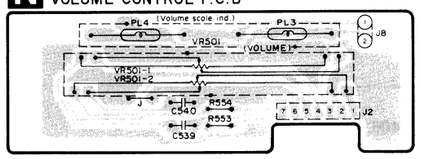
F dbx DECODER P.C.B. TP452



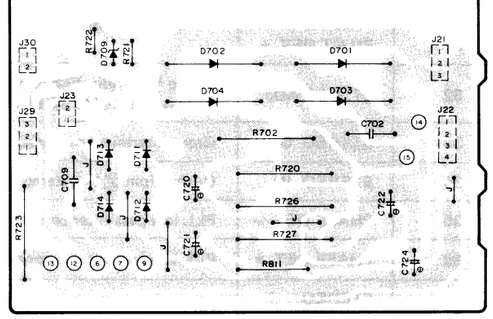
I



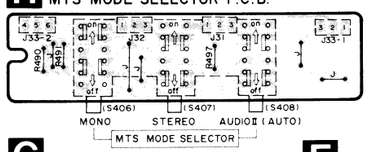
N VOLUME CONTROL P.C.B



S POWER SUPPLY P.C.B.

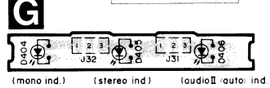


H MTS MODE SELECTOR P.C.B.

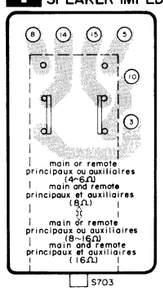


TP407

G

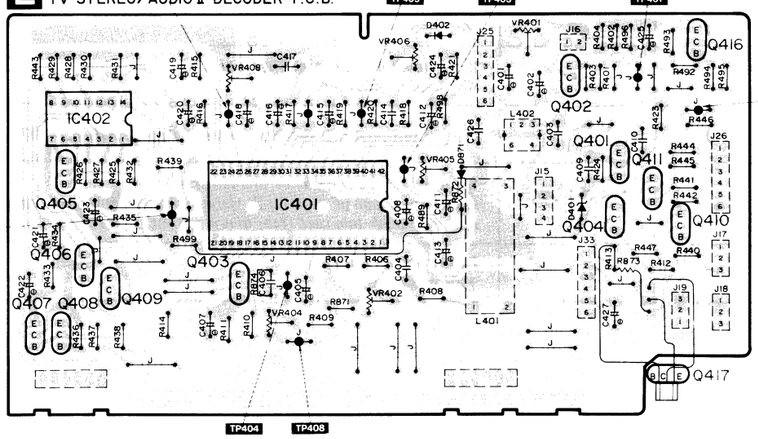


T SPEAKER IMPEDANCE P.C.B



SPEAKER IMPEDANCE

E TV STEREO/AUDIO II DECODER P.C.B. TP405 TP403 TP401



TP401 Input level adj.
TP402 Ground
TP403 TV stereo L.P.F. adj.
TP404 Audio II VCO adj.
TP405 TV stereo VCO adj.
TP407 Audio II VCO adj.
TP408 Audio II VCO adj.
TP409 Ground
TP450 } dbx timing adj.
TP451 }
TP452 TV stereo dbx in level adj.
TP453 Ground

■ RESISTORS AND CAPACITORS

Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. The "S" mark is service standard parts and may differ from production parts.
4. The unit of resistance is Ω, (ohm). K = 1000Ω, M = 1000kΩ.
5. The unit of capacitance is μF. (microfarad). P = 10^{-6} μF.
6. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all area.

Numbering System of Resistor

Example

ERD	25	F	J	101
Type	Wattage	Shape	Tolerance	Value

ERG	2	AN	J	2R2
Type	Wattage	Shape	Tolerance	Value

Resistor Type		Wattage		Tolerance	
ERD	: Carbon	10	: 1/8W	G	: ± 2%
ERO	: Metal Film	12	: 1/2W	J	: ± 5%
ERG	: Metal Oxide	25	: 1/4W		
ERC	: Solid	1	: 1W		
ERX	: Metal Film	2	: 2W		
		S1	: 1/2W		
		S2	: 1/4W		

ERD10TLJ□□□ → Chip type carbon
ERO10MKG□□□ → Chip type metal film

Numbering System of Capacitor

Example

ECKD	1H	102	Z	F
Type	Voltage	Value	Tolerance	Peculiarity

ECEA	50	M	R47	R
Type	Voltage	Peculiarity	Value	Special use

Capacitor Type		Voltage: ECEA Type		Voltage: Other		Tolerance	
ECEA	: Electrolytic	OJ	: 6.3V	1H	: 50V	C	: ± 0.25pF
ECCD	: Ceramic	1A	: 10V			J	: ± 5%
ECKD	: Ceramic	1C	: 16V	1	: 100V	K	: ± 10%
ECQM	: Polyester	1E	: 25V			Z	: +80%, −20%
ECQP	: Polypropylene	1H	: 50V			Y	: ± 22%
ECET	: Electrolytic	1J	: 63V				
ECEA...N	: Non Polar Electrolytic	1V	: 35V				
		2A	: 100V				

● RESISTORS

Ref. No.	Part No.	Value
R1, 2	ERD10TLJ391U	390
R3, 4	ERD10TLJ224U	220K
R5, 6	ERO10MKG5622	56.2K
R7, 8	ERD10TLJ271U	270
R9, 10	ERD10TLJ680U	68
R11, 12	ERD10TLJ184U	180K
R13, 14	ERD10TLJ123U	12K
R15, 16	ERD10TLJ563U	56K
R17, 18	ERD10TLJ102U	1K
R71, 72	ERD10TLJ334U	330K
R73, 74	ERD10TLJ102U	1K
R75, 76	ERD10TLJ124U	120K
R77, 78	ERD10TLJ103U	10K
R79, 80	ERD10TLJ220U	22
R201	ERDS2TJ221	220
R202	ERDS2TJ391	390
R203	ERDS2TJ102	1K
R204	ERDS2TJ391	390
R205	ERDS2TJ822	8.2K
R206	ERDS2TJ222	2.2K
R207	ERDS2TJ471	470
R208	ERDS2TJ102	1K
R209	ERDS2TJ332	3.3K
R210	ERDS2TJ103	10K
R211	ERDS2TJ223	22K
R212	ERDS2TJ102	1K
R213	ERDS2TJ104	100K
R214	ERDS2TJ152	1.5K
R215	ERDS2TJ102	1K
R216	ERDS2TJ222	2.2K
R220	ERDS2TJ274	270K
R221	ERDS2TJ391	390
R222	ERDS2TJ102	1K
R223	ERDS2TJ101	100
R224	ERDS2TJ221	220
R225	ERDS2TJ563	56K
R226	ERDS1FJ680	68
R227, 228	ERDS2TJ104	100K
R229	ERDS2TJ333	33K
R230	ERDS2TJ823	82K
R231	ERDS2TJ123	12K
R232, 233	ERDS2TJ683	68K
R234	ERDS2TJ473	47K
R235	ERDS2TJ391	390

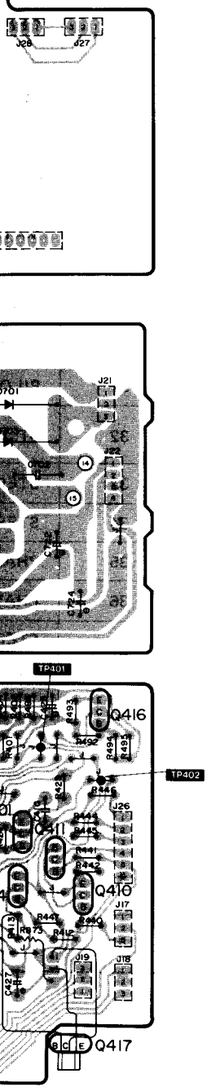
Ref. No.	Part No.	Value
R236	ERDS2TJ222	2.2K
R237	ERDS2TJ470	47
R238	ERDS2TJ561	560
R239	ERDS2TJ102	1K
R240	ERDS2TJ331	330
R241	ERDS2TJ334	330K
R242	ERDS2TJ102	1K
R243	ERDS2TJ224	220K
R244	ERDS2TJ152	1.5K
R245	ERDS2TJ561	560
R246	ERDS2TJ104	100K
R247	ERDS2TJ393	39K
R248	ERDS2TJ152	1.5K
R249	ERDS2TJ102	1K
R250	ERDS2TJ151	150
R251	ERDS2TJ474	470K
R260	ERDS2TJ223	22K
R261	ERDS2TJ103	10K
R262	ERDS2TJ473	47K
R263	ERDS2TJ103	10K
R264, 265	ERDS2TJ473	47K
R266, 267	ERDS2TJ473	47K
R268	ERDS2TJ222	2.2K
R269	ERDS2TJ473	47K
R270	ERDS2TJ824	820K
R271	ERDS2TJ224	220K
R273	ERDS2TJ154	150K
R274	ERDS2TJ332	3.3K
R275	ERDS2TJ392	3.9K
R280	ERDS2TJ183	18K
R281	ERDS2TJ561	560
R282	ERDS2TJ103	10K
R283	ERDS2TJ154	150K
R284	ERDS2TJ104	100K
R285	ERDS2TJ154	15K
R286	ERDS2TJ273	27K
R287	ERDS2TJ104	100K
R288	ERDS2TJ181	180
R290	ERDS2TJ123	12K
R292	ERDS2TJ823	82K
R294	ERDS2TJ333	33K
R295	ERDS2TJ564	560K
R296	ERDS2TJ104	100K
R297	ERDS2TJ564	560K

Ref. No.	Part No.	Value
R298	ERDS2TJ472	4.7K
R301	ERDS2TJ151	150
R302	ERDS2TJ103	10K
R303, 304	ERDS2TJ223	22K
R305, 306	ERDS2TJ182	1.8K
R307, 308	ERDS2TJ273	27K
R309, 310	ERDS2TJ562	5.6K
R311	ERDS2TJ153	15K
R312	ERDS2TJ102	1K
R313	ERDS2TJ124	120K
R314	ERDS2TJ103	10K
R315, 316	ERDS2TJ182	1.8K
R401	ERDS2TJ223	22K
R402	ERDS2TJ104	100K
R403	ERDS2TJ561	560
R404	ERDS2TJ102	1K
R406, 407	EROS2TKG2002	2K
R408	ERDS2TJ222	2.2K
R409	ERDS2TJ124	120K
R410	ERDS2TJ102	1K
R411	ERDS2TJ473	47K
R412	ERDS2TJ104	100K
R413	ERDS2TJ473	4.7K
R414	ERDS2TJ104	100K
R415, 416	ERDS2TJ222	2.2K
R417	EROS2TKF2401	2.4K
R418	ERDS2TJ822	8.2K
R419	ERDS2TJ824	820K
R420	ERDS2TJ103	10K
R421	ERDS2TJ561	560
R423	ERDS1FJ220	22
R424	ERDS1FJ102	1K
R425, 426	ERDS1FJ104	100K
R427, 428	ERDS1FJ104	100K
R429	ERDS1FJ104	100K
R430	ERDS2TJ822	8.2K
R431	ERDS1FJ562	5.6K
R432	ERDS2TJ154	150K
R433	ERDS1FJ104	100K
R434	ERDS2TJ473	47K
R435	ERDS2TJ223	22K
R436	ERDS2TJ333	33K
R437	ERDS1FJ102	1K
R438, 439	ERDS1FJ103	10K

Ref. No.	Part No.	Value
R440	ERDS1FJ103	10K
R441	ERDS1FJ153	15K
R442	ERDS1FJ103	10K
R443	ERDS1FJ104	100K
R444	ERDS1FJ221	220
R445	ERDS1FJ681	680
R446	ERDS1FJ391	390
R447	ERDS2TJ473	47K
R448, 449	ERDS1FJ222	2.2K
R450	ERDS1FJ471	470
R451	ERDS2TJ104	100K
R452	ERDS2TJ222	2.2K
R453	ERDS2TJ332	3.3K
R454, 455	ERDS2TJ223	22K
R456	ERDS2TJ332	3.3K
R457, 458	ERDS2TJ472	4.7K
R459, 460	ERDS2TJ472	4.7K
R461	EROS2TKG2002	20K
R462	ERDS2TJ103	10K
R463	ERDS2TJ333	33K
R464	ERDS2TJ332	3.3K
R465	EROS2TKG3601	3.6K
R466, 467	ERDS2TJ184	180K
R468	ERDS2TJ184	180K
R469	EROS2TKF1001	1K
R470	ERDS2TJ151	150
R471	EROS2TKG5101	5.1K
R472	ERDS2TJ683	68K
R473	ERDS2TJ151	150
R474	ERDS2TJ332	3.3K
R475	ERDS2TJ393	39K
R476, 477	ERDS2TJ394	390K
R478	EROS2TKG3601	3.6K
R479	ERDS2TJ184	180K
R480	ERDS2TJ563	56K
R481	ERDS2TJ104	100K
R482	ERDS2TJ103	10K
R483, 484	ERDS2TJ473	47K
R485	ERDS2TJ473	47K
R486	ERDS2TJ223	22K
R489	ERDS2TJ120	12
R490	ERDS2TJ331	330
R491	ERDS2TJ222	2.2K
R492	ERDS2TJ104	100K

● CAPACITOR

Ref. No.		Part
C1, 2		ECEA1
C3, 4	S	ECCD1
C5, 6	S	ECKD1
C7, 8	S	ECQM1
C9, 10	S	ECQM1
C11, 12		ECEA1
C13, 14		ECEA0
C71, 72		ECEA1
C73, 74	S	ECCD1
C75, 76	S	ECCD1
C77, 78	S	ECKD1
C99, 201	S	ECKD1
C202	S	ECKD1
C203, 204	S	ECKD1
C205	S	ECKD1
C206, 207	S	ECKD1
C208	S	ECCD1
C209	S	ECCD1
C210		ECEA1
C211		ECEA0
C212		ECEA1
C213		ECQP1
C214	S	ECQM1
C215	S	ECCD1
C216	S	ECCD1
C217	S	ECCD1
C218	S	ECKD1
C219	S	ECKD1
C220		ECEA1
C221		ECEA1
C222		ECKD1
C230	S	ECKD1
C231, 232	S	ECKD1
C233	S	ECKD1
C234	S	ECKD1
C235	S	ECKD1
C236		ECEA1
C237		ECEA1
C238		ECEA1
C239		ECEA1
C240	S	ECKD1
C241		ECEA1
C242	S	ECCD1
C243, 244	S	ECKD1
C245, 246	S	ECKD1
C247	S	ECCD1
C248, 249	S	ECKD1
C250, 251	S	ECKD1
C252	S	ECCD1
C253	S	ECCD1
C255	S	ECCD1
C270	S	ECQM1
C271		ECEA1



■ RESISTORS AND CAPACITORS

Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. The "Ⓢ" mark is service standard parts and may differ from production parts.
4. The unit of resistance is Ω , (ohm). K = 1000Ω, M = 1000kΩ.
5. The unit of capacitance is μF. (microfarad). P = 10^{-6} μF.
6. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all area.

Numbering System of Resistor

Example

ERD	25	F	J	101
Type	Wattage	Shape	Tolerance	Value

ERG	2	AN	J	2R2
Type	Wattage	Shape	Tolerance	Value

Resistor Type	Wattage	Tolerance
ERD : Carbon	10 : 1/8W	G : ± 2%
ERO : Metal Film	12 : 1/2W	J : ± 5%
ERG : Metal Oxide	25 : 1/4W	
ERC : Solid	1 : 1W	
ERX : Metal Film	2 : 2W	
	S1 : 1/2W	
	S2 : 1/4W	

ERD10TLJ□□□ → Chip type carbon
ERO10MKG□□□ → Chip type metal film

Numbering System of Capacitor

Example

ECKD	1H	102	Z	F
Type	Voltage	Value	Tolerance	Peculiarity

ECEA	50	M	R47	R
Type	Voltage	Peculiarity	Value	Special use

Capacitor Type	Voltage: ECEA Type	Voltage: Other	Tolerance
ECEA : Electrolytic	OJ : 6.3V	1H : 50V	C : ± 0.25pF
ECCD : Ceramic	1A : 10V		J : ± 5%
ECKD : Ceramic	1C : 16V	1 : 100V	K : ± 10%
ECQM : Polyester	1E : 25V		Z : +80%, −20%
ECQP : Polypropylene	1H : 50V		Y : ± 22%
ECET : Electrolytic	1J : 63V		
ECEA...N : Non Polar Electrolytic	1V : 35V		
	2A : 100V		

● RESISTORS

Ref. No.	Part No.	Value
R1, 2	ERD10TLJ391U	390
R3, 4	ERD10TLJ224U	220K
R5, 6	ERO10MKG5622	56.2K
R7, 8	ERD10TLJ271U	270
R9, 10	ERD10TLJ680U	68
R11, 12	ERD10TLJ184U	180K
R13, 14	ERD10TLJ123U	12K
R15, 16	ERD10TLJ563U	56K
R17, 18	ERD10TLJ102U	1K
R71, 72	ERD10TLJ334U	330K
R73, 74	ERD10TLJ102U	1K
R75, 76	ERD10TLJ124U	120K
R77, 78	ERD10TLJ103U	10K
R79, 80	ERD10TLJ220U	22
R201	ERDS2TJ221	220
R202	ERDS2TJ391	390
R203	ERDS2TJ102	1K
R204	ERDS2TJ391	390
R205	ERDS2TJ822	8.2K
R206	ERDS2TJ222	2.2K
R207	ERDS2TJ471	470
R208	ERDS2TJ102	1K
R209	ERDS2TJ332	3.3K
R210	ERDS2TJ103	10K
R211	ERDS2TJ223	22K
R212	ERDS2TJ102	1K
R213	ERDS2TJ104	100K
R214	ERDS2TJ152	1.5K
R215	ERDS2TJ102	1K
R216	ERDS2TJ222	2.2K
R220	ERDS2TJ274	270K
R221	ERDS2TJ391	390
R222	ERDS2TJ102	1K
R223	ERDS2TJ101	100
R224	ERDS2TJ221	220
R225	ERDS2TJ563	56K
R226	ERDS1FJ680	68
R227, 228	ERDS2TJ104	100K
R229	ERDS2TJ333	33K
R230	ERDS2TJ823	82K
R231	ERDS2TJ123	12K
R232, 233	ERDS2TJ683	68K
R234	ERDS2TJ473	47K
R235	ERDS2TJ391	390

Ref. No.	Part No.	Value
R236	ERDS2TJ222	2.2K
R237	ERDS2TJ470	47
R238	ERDS2TJ561	560
R239	ERDS2TJ102	1K
R240	ERDS2TJ331	330
R241	ERDS2TJ334	330K
R242	ERDS2TJ102	1K
R243	ERDS2TJ224	220K
R244	ERDS2TJ152	1.5K
R245	ERDS2TJ561	560
R246	ERDS2TJ104	100K
R247	ERDS2TJ393	39K
R248	ERDS2TJ152	1.5K
R249	ERDS2TJ102	1K
R250	ERDS2TJ151	150
R251	ERDS2TJ474	470K
R260	ERDS2TJ223	22K
R261	ERDS2TJ103	10K
R262	ERDS2TJ473	47K
R263	ERDS2TJ103	10K
R264, 265	ERDS2TJ473	47K
R266, 267	ERDS2TJ473	47K
R268	ERDS2TJ222	2.2K
R269	ERDS2TJ473	47K
R270	ERDS2TJ824	820K
R271	ERDS2TJ224	220K
R273	ERDS2TJ154	150K
R274	ERDS2TJ332	3.3K
R275	ERDS2TJ392	3.9K
R280	ERDS2TJ183	18K
R281	ERDS2TJ561	560
R282	ERDS2TJ103	10K
R283	ERDS2TJ154	150K
R284	ERDS2TJ104	100K
R285	ERDS2TJ154	15K
R286	ERDS2TJ273	27K
R287	ERDS2TJ104	100K
R288	ERDS2TJ181	180
R290	ERDS2TJ123	12K
R292	ERDS2TJ823	82K
R294	ERDS2TJ333	33K
R295	ERDS2TJ564	560K
R296	ERDS2TJ104	100K
R297	ERDS2TJ564	560K

Ref. No.	Part No.	Value
R298	ERDS2TJ472	4.7K
R301	ERDS2TJ151	150
R302	ERDS2TJ103	10K
R303, 304	ERDS2TJ223	22K
R305, 306	ERDS2TJ182	1.8K
R307, 308	ERDS2TJ273	27K
R309, 310	ERDS2TJ562	5.6K
R311	ERDS2TJ153	15K
R312	ERDS2TJ102	1K
R313	ERDS2TJ124	120K
R314	ERDS2TJ103	10K
R315, 316	ERDS2TJ182	1.8K
R401	ERDS2TJ223	22K
R402	ERDS2TJ104	100K
R403	ERDS2TJ561	560
R404	ERDS2TJ102	1K
R406, 407	EROS2TKG2002	2K
R408	ERDS2TJ222	2.2K
R409	ERDS2TJ124	120K
R410	ERDS2TJ102	1K
R411	ERDS2TJ473	47K
R412	ERDS2TJ104	100K
R413	ERDS2TJ473	4.7K
R414	ERDS2TJ104	100K
R415, 416	ERDS2TJ222	2.2K
R417	EROS2TKF2401	2.4K
R418	ERDS2TJ822	8.2K
R419	ERDS2TJ824	820K
R420	ERDS2TJ103	10K
R421	ERDS2TJ561	560
R423	ERDS1FJ220	22
R424	ERDS1FJ102	1K
R425, 426	ERDS1FJ104	100K
R427, 428	ERDS1FJ104	100K
R429	ERDS1FJ104	100K
R430	ERDS2TJ822	8.2K
R431	ERDS1FJ562	5.6K
R432	ERDS2TJ154	150K
R433	ERDS1FJ104	100K
R434	ERDS2TJ473	47K
R435	ERDS2TJ223	22K
R436	ERDS2TJ333	33K
R437	ERDS1FJ102	1K
R438, 439	ERDS1FJ103	10K

Ref. No.	Part No.	Value
R440	ERDS1FJ103	10K
R441	ERDS1FJ153	15K
R442	ERDS1FJ103	10K
R443	ERDS1FJ104	100K
R444	ERDS1FJ221	220
R445	ERDS1FJ681	680
R446	ERDS1FJ391	390
R447	ERDS2TJ473	47K
R448, 449	ERDS1FJ222	2.2K
R450	ERDS1FJ471	470
R451	ERDS2TJ104	100K
R452	ERDS2TJ222	2.2K
R453	ERDS2TJ332	3.3K
R454, 455	ERDS2TJ223	22K
R456	ERDS2TJ332	3.3K
R457, 458	ERDS2TJ472	4.7K
R459, 460	ERDS2TJ472	4.7K
R461	EROS2TKG2002	20K
R462	ERDS2TJ103	10K
R463	ERDS2TJ333	33K
R464	ERDS2TJ332	3.3K
R465	EROS2TKG3601	3.6K
R466, 467	ERDS2TJ184	180K
R468	ERDS2TJ184	180K
R469	EROS2TKF1001	1K
R470	ERDS2TJ151	150
R471	EROS2TKG5101	5.1K
R472	ERDS2TJ683	68K
R473	ERDS2TJ151	150
R474	ERDS2TJ332	3.3K
R475	ERDS2TJ393	39K
R476, 477	ERDS2TJ394	390K
R478	EROS2TKG3601	3.6K
R479	ERDS2TJ184	180K
R480	ERDS2TJ563	56K
R481	ERDS2TJ104	100K
R482	ERDS2TJ103	10K
R483, 484	ERDS2TJ473	47K
R485	ERDS2TJ473	47K
R486	ERDS2TJ223	22K
R489	ERDS2TJ120	12
R490	ERDS2TJ331	330
R491	ERDS2TJ222	2.2K
R492	ERDS2TJ104	100K

Ref. No.	Part No.	Value
R493	ERDS2TJ331	330
R494	ERDS2TJ394	390K
R495	ERDS2TJ102	1K
R496	ERDS2TJ471	470
R497	ERDS2TJ681	680
R498	ERDS2TJ332	3.3K
R499	ERDS2TJ104	100K
R501, 502	ERDS2TJ102	1K
R503, 504	ERDS2TJ333	33K
R505, 506	ERDS2TJ333	33K
R507, 508	ERDS2TJ333	33K
R509, 510	ERDS2TJ222	2.2K
R511, 512	ERDS2TJ104	100K
R513, 514	ERDS2TJ474	470K
R515	ERDS2TJ103	10K
R516	ERDS2TJ474	470K
R517, 518	ERDS2TJ103	10K
R523, 524	ERDS1FJ681	680
R525, 526	ERDS1FJ681	680
R527, 528	ERDS2TJ824	820K
R529, 530	ERDS2TJ682	6.8K
R531, 532	ERDS2TJ474	470K
R533, 534	ERDS2TJ474	470K
R537, 538	ERDS2TJ392	3.9K
R541, 542	ERDS2TJ102	1K
R543, 544	ERDS2TJ223	22K
R545, 546	ERDS2TJ393	3.3K
R547, 548	ERDS2TJ332	3.3K
R549	ERDS2TJ103	10K
R551	ERDS2TJ474	470K
R552	ERDS2TJ473	47K
R553, 554	ERDS2TJ222	2.2K
R555, 556	ERDS2TJ102	1K
R557, 558	ERDS2TJ152	1.5K

Ref. No.	Part No.	Value
R559, 560	ERDS2TJ824	820K
R561, 562	ERDS2TJ824	820K
R563, 564	ERDS2TJ102	1K
R565, 566	ERDS2TJ474	470K
R567	ERDS2TJ223	2.2K
R568	ERDS2TJ473	47K
R569	ERDS2TJ101	100
R571	ERDS2TJ102	1K
R572	ERDS2TJ103	10K
R573, 574	ERDS2TJ152	1.5K
R575	ERDS2TJ822	8.2K
R576	ERDS2TJ273	27K
R577, 578	ERDS2TJ103	10K
R579	ERDS2TJ472	4.7K
R581, 582	ERDS2TJ103	10K
R583, 584	ERDS2TJ153	15K
R585, 586	ERDS2TJ103	10K
R587, 588	ERDS2TJ103	10K
R589	ERDS2TJ103	10K
R590	ERDS2TJ472	4.7K
R591	ERDS2TJ102	1K
R593, 594	ERDS2TJ102	1K
R595, 596	ERDS2TJ102	1K
R597	ERDS2TJ220	22
R598	ERDS2TJ104	100K
R601, 602	ERDS2TJ472	4.7K
R603, 604	ERDS2TJ124	120K
R605, 606	ERDS2TJ102	1K
R607	ERDS2TJ102	1K
R608 ⚠	ERDS2TJ682	6.8K
R609, 610	ERDS2TJ680	68
R611, 612	ERDS2TJ471	470
R613, 614	ERDS2TJ682	6.8K
R615, 616	ERDS2TJ474	470K

Ref. No.	Part No.	Value
R617, 618 ⚠	ERD25FJ680	68
R619, 620	ERD25FJ100	10
R621, 622	ERG1ANJ100	10
R623, 624	ERG1ANJ331	330
R626	ERDS2TJ273	27K
R627	ERDS2TJ223	22K
R630	ERDS2TJ123	12K
R701 Except ⚠ [PA, PE, PC]	ERC12ZGK335	3.3M
R702 ⚠	ERX2ANJ4R7	4.7
R703 ⚠	ERDS1FJ152	1.5K
R704	ERDS2TJ821	820
R705	ERDS2TJ103	10K
R706	ERDS2TJ272	2.7K
R707	ERDS2TJ222	2.2K
R709 ⚠	ERDS1FJ681	680
R710	ERDS2TJ221	220
R711 ⚠	ERDS1FJ471	470
R712 ⚠	ERDS2TJ123	12K
R713, 714 ⚠	ERDS1FJ270	27
R715, 716	ERDS1FJ270	27
R717	ERDS2TJ123	12K
R718	ERDS2TJ151	150
R720	ERX2ANJ4R7	4.7
R721 ⚠	ERDS1FJ152	1.5K
R722	ERDS2TJ102	1K
R723	ERG2ANJP101S	100
R726, 727	ERX2ANJ4R7	4.7
R801, 802	ERDS2TJ683	68K
R803, 804	ERDS2TJ333	33K
R805	ERDS2TJ103	10K
R806	ERDS2TJ183	18K
R807	ERDS2TJ104	100K
R808	ERDS2TJ224	220K

Ref. No.	Part No.	Value
R809	ERDS2TJ223	22K
R810	ERDS2TJ104	100K
R811 ⚠	ERG1ANJ561	560
R812	ERDS2TJ153	15K
R813	ERD25FJ560	56
R815, 816	ERDS2TJ333	33K
R871	ERDS2TJ683	68K
R872	ERDS2TJ273T	27K
R873	ERDS2TJ472	4.7K
R874	ERDS2TJ104	100K
R901	ERDS2TJ102	1K
R902	ERDS2TJ561	560
R903	ERDS2TJ123	12K
R904	ERDS2TJ562	5.6K
R905	ERDS2TJ101	100
R906	ERDS2TJ103	10K
R907	ERDS2TJ104	100K
R908	ERDS2TJ273	27K
R909	ERDS2TJ822	8.2K
R910	ERDS2TJ104	100K
R911	ERDS2TJ221	220
R912	ERDS2TJ104	100K
R913	ERDS2TJ102	1K
R914, 915	ERDS2TJ224	220K
R916	ERDS2TJ103	10K
R917, 918	ERDS2TJ221	220
R919, 920	ERDS2TJ824	820K
R921, 922	ERDS2TJ824	820K
R923, 924	ERDS2TJ824	820K
R925	ERDS2TJ824	820K
R929	ERDS2TJ273	27K
R998	ERDS2TJ182	1.8K
R999	ERDS2TJ103	10K

● CAPACITORS

Ref. No.	Part No.	Value
C1, 2	ECEA1HU3R3	3.3
C3, 4 Ⓢ	ECCD1H101K	100P
C5, 6 Ⓢ	ECKD1H102KB	0.001
C7, 8 Ⓢ	ECQM1H223JZ	0.022
C9, 10 Ⓢ	ECQM1H682JZ	0.0068
C11, 12	ECEA1HN010S	1
C13, 14	ECEA0JU330	33
C71, 72	ECEA1HU3R3	3.3
C73, 74 Ⓢ	ECCD1H390K	39P
C75, 76 Ⓢ	ECCD1H820K	82P
C77, 78 Ⓢ	ECKD1H391KB	390P
C99, 201 Ⓢ	ECKD1H103ZF	0.01
C202 Ⓢ	ECKD1H223ZF	0.022
C203, 204 Ⓢ	ECKD1H103ZF	0.01
C205 Ⓢ	ECKD1H103ZF	0.01
C206, 207 Ⓢ	ECKD1H223ZF	0.022
C208 Ⓢ	ECCD1H080CC	8P
C209 Ⓢ	ECCD1H470K	47P
C210	ECEA1HU3R3	3.3
C211	ECEA0JU101	100
C212	ECEA1CU100	10
C213	ECQP1471JZ	470P
C214 Ⓢ	ECQM1H473JZ	0.047
C215 Ⓢ	ECCD1H100KC	10P
C216 Ⓢ	ECCD1H150KC	15P
C217 Ⓢ	ECCD1H101K	100P
C218 Ⓢ	ECKD1H103ZF	0.01
C219 Ⓢ	ECKD1H223ZF	0.022
C220	ECEA1CU100	10
C221	ECEA1HU010	1
C222	ECKD1H103ZF	0.01
C230 Ⓢ	ECKD1H102ZF	0.001
C231, 232 Ⓢ	ECKD1H103ZF	0.01
C233 Ⓢ	ECKD1H102ZF	0.001
C234 Ⓢ	ECKD1H103ZF	0.01
C235 Ⓢ	ECKD1H102ZF	0.001
C236	ECEA1CU100	10
C237	ECEA1HUR47	0.47
C238	ECEA1VU4R7	4.7
C239	ECEA1HU010	1
C240 Ⓢ	ECKD1H103ZF	0.01
C241	ECEA1HUR47	0.47
C242 Ⓢ	ECCD1H151K	150P
C243, 244 Ⓢ	ECKD1H103ZF	0.01
C245, 246 Ⓢ	ECKD1H103ZF	0.01
C247 Ⓢ	ECCD1H180KC	18P
C248, 249 Ⓢ	ECKD1H103ZF	0.01
C250, 251 Ⓢ	ECKD1H103ZF	0.01
C252 Ⓢ	ECCD1H100KC	10P
C253 Ⓢ	ECCD1H151K	150P
C255 Ⓢ	ECCD1H100KC	10P
C270 Ⓢ	ECQM1H183JZ	0.018
C271	ECEA1HU2R2	2.2

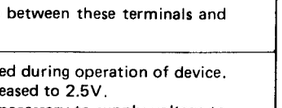
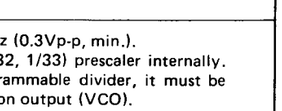
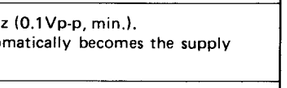
Ref. No.	Part No.	Value
C272	ECKD1H223ZF	0.022
C273, 274	ECEA1VU4R7	4.7
C275 Ⓢ	ECKD1H223ZF	0.022
C276, 277	ECEA1HUR47	0.47
C278	ECEA1VU4R7	4.7
C279	ECEA1HU3R3	3.3
C301	ECEA1CU101	100
C302	ECEA1HU010	1
C303	ECEA1HU3R3	3.3
C304	ECEA1HUR47	0.47
C305, 306	ECEA1HU3R3	3.3
C307, 308 Ⓢ	ECQM1H123JZ	0.039
C309, 310	ECQM1H332JZ	0.0033
C311 Ⓢ	ECKD1H103ZF	0.01
C312 Ⓢ	ECQM1H473JZ	0.047
C313	ECQP1471JZ	470P
C314 Ⓢ	ECKD1H103ZF	0.01
C315	ECEA1CU100	100
C316	ECCD1H151K	150P
C401, 402	ECEA1CKS100	10
C403	ECQM1H182JZ	0.0018
C404	ECQM1H102JZ	0.001
C406	ECQB1H152JZ	0.0015
C407	ECEA1HKS010	1
C408	ECEA1AK101	100
C409, 410	ECKD1H103ZF	0.01
C411	ECEA1CKS100	10
C412	ECEA1HKS010	1
C413	ECEA1CKS100	10
C414	ECQP1182JZ	0.0018
C415	ECEA1HKS010	1
C416	ECEA1HKS010	1
C417 Ⓢ	ECQM1H333JZ	0.033
C418, 419	ECEA1CKS100	10
C420	ECEA1CKS100	10
C421, 422	ECEA1HKS010	1
C423	ECEA1CKS470	47
C424	ECEA1HKS4R7	4.7
C425	ECEA1CKS470	47
C426 Ⓢ	ECQM1H224JZ	0.22
C427	ECEA1CKS470	47
C450	ECEA1CKS100	10
C451	ECEA1HKS010	1
C452	ECQB1H222JZ	0.0022
C453 Ⓢ	ECQM1H474JZ	0.47
C454 Ⓢ	ECQM1H333JZ	0.033
C455	ECEA1AK101	100
C456, 457 Ⓢ	ECQM1H332JZ	0.033
C458, 459 Ⓢ	ECQM1H332JZ	0.033
C460	ECQM1H224JZ	0.22
C461	ECQB1H222JZ	0.0022
C462	ECQM1H224JZ	0.22
C463	ECEA50M3R3R	3.3

Ref. No.	Part No.	Value
C464	ECEA1HKSR47B	0.47
C465	ECQB1H472JZ	0.0047
C466	ECEA50M3R3R	3.3
C467 ⚠ Ⓢ	ECEA1CKS100	10
C468	ECEA1HKS010	1
C469 ⚠ Ⓢ	ECEA16M10R	10
C470	ECQB1H472JZ	0.047
C471	ECEA1CKS470	47
C472	ECEA1HKS010	1
C473	ECQB1H103JZ	0.01
C474 Ⓢ	ECQM1H104JZ	0.1
C475	ECEA1HKS010	1
C476	ECQB1H222JZ	0.0022
C477	ECEA1HKS010B	1
C478	ECKD1H103ZF	0.01
C479	ECEA1HKS3R3B	3.3
C480, 481	ECEA1CKS100	10
C482	ECKD1H103JZ	0.01
C501, 502 Ⓢ	ECCD1H680K	68P
C503, 504 Ⓢ	ECCD1H101K	100P
C505 Ⓢ	ECQM1H223JZ	0.022
C506	ECQM1H102JZ	0.001
C507, 508 Ⓢ	ECCD1H101K	100P
C509 Ⓢ	ECCD1H100KC	10P
C511, 512	ECEA1HU010	1
C514	ECEA1EU3R3	3.3
C516	ECEA1HU3R3	3.3
C517, 518 Ⓢ	ECCD1H101K	100P
C519, 520	ECEA1EU3R3	3.3
C521, 522 Ⓢ	ECCD1H101K	100P
C523, 524	ECEA1HU010	1
C525, 526 Ⓢ	ECCD1H390K	39P
C527, 528 Ⓢ	ECQM1H104JZ	0.1
C529, 530 Ⓢ	ECQM1H332JZ	0.0033
C531, 532 Ⓢ	ECQM1H393JZ	0.039
C533, 534 Ⓢ	ECQM1H333JZ	0.033
C535, 536 Ⓢ	ECQM1H183JZ	0.018
C537, 538 Ⓢ	ECQM1H104JZ	0.1
C539, 540	ECKD1H331KB	330
C541 Ⓢ	ECCD1H101K	100P
C543, 544 Ⓢ	ECQM1H563JZ	0.056
C545, 546	ECEA1HU010	1
C549, 550 Ⓢ	ECQM1H123JZ	0.012
C571, 572	ECEA1HU010	1
C573	ECEA1HU010	1
C574, 575	ECEA1EU4R7	4.7
C576	ECEA1EU4R7	4.7
C577, 578	ECQM1H223JZ	0.022
C580	ECEA1EU221	220
C601, 602	ECEA1HN100S	10
C603, 604 Ⓢ	ECCD1H080CC	8P
C605, 606 Ⓢ	ECKD1H821KB	820P
C607, 608 Ⓢ	ECCD1H080CC	8P

Ref. No.	Part No.	Value
C609, 610 Ⓢ	ECCD1H180KC	18P
C611, 612	ECEA1HU010	1
C613, 614 ⚠ Ⓢ	ECCD1H101K	100P
C615, 616 ⚠ Ⓢ	ECCD1H101K	100P
C617	ECEA1JU330	33
C618	ECEA1JU470	47
C619, 620 Ⓢ	ECQM1H473JZ	0.047
C621, 622	ECEA2AU100	10
C623 Ⓢ	ECKD1H103ZF	0.01
C624	ECEA1HN3R3	3.3
C701 ⚠	ECKDKC103PF2	0.01
C702 ⚠	ECKD2H103PE	0.01
C703, 704 ⚠ [M, MC]	ECETS56V822U	8200
C703, 704 ⚠ [PA, PE, PC]	ECES1JU822U	8200
C705	ECEA1HU101	100
C706 Ⓢ	ECKD1H103ZF	0.01
C707	ECEA1AU101	100
C708 Ⓢ	ECKD1H103ZF	0.01
C709 ⚠	ECKD2H103PE	0.01
C710	ECEA1VU101	100
C711 Ⓢ	ECKD1H103ZF	0.01
C712	ECEA1CU470	47
C713, 714 Ⓢ	ECKD1H103ZF	0.01
C715	ECEA1EU100	10
C716 Ⓢ	ECKD1H103ZF	0.01
C720, 721 ⚠	ECEA1HU331	330
C722	ECEA1HU471	470
C724	ECEA1HU471	470
C801	ECEA1EU3R3	3.3
C802	ECEA0JU331	330
C803	ECEA1EU4R7	4.7
C804 Ⓢ	ECQM1H103JZ	0.01
C805	ECEA1CU330	33
C899	ECKD1H223ZF	0.022
C901 Ⓢ	ECKD1H103ZF	0.01
C902	ECEA25M4R7R	4.7
C903	ECEA1VU100	10
C904	ECEA0JU101	100
C905 Ⓢ	ECKD1H103ZF	0.01
C906 Ⓢ	ECCD1H470K	47P
C907 Ⓢ	ECCD1H080CC	8P
C908 Ⓢ	ECKD1H103ZF	0.01
C911	ECEA1HU010	1
C912	ECEA1VU4R7	4.7
C999	ECEA1CU100B	10

■ FUNCTION OF TERMINAL (PLL CONTROLLER IC901)

• PLL CONTROLLER IC (IC901)

Pin No.	Mark	Description of terminal
1 ⟆ 4 34 ⟆ 52	LCD4 ⟆ LCD1 LCD23 ⟆ LCD5	Segment signal output terminal for display.
5	COM2	Common signal output terminal connected to LCD. Output is delivered in 3 values of earth, 1/2VDD and VDD (at 5 ms intervals) in a period of 50 Hz. The segment turns ON when the difference in voltage is ± VDD between these terminals and LCD1 ~ LCD23.
6	COM1	
7	VDD	Power supply terminal of device. Voltage of 5V ± 10% is supplied during operation of device. To hold the internal data memory (RAM), the voltage can be decreased to 2.5V. **Note:** Pins 7 and 33 are connected inside the chip. So, it is unnecessary to supply voltage to the pins.
8	FM	Input is local oscillation output (VCO) in a range of 10 ~ 130 MHz (0.3Vp-p, min.). There are 1/2 fixed frequency division prescaler and 2-step (1/32, 1/33) prescaler internally. Therefore, when deciding the frequency dividing value of programmable divider, it must be decided from the frequency obtained by halving the local oscillation output (VCO).
9	AM	Input is local oscillation output (VCO) in a range of 0.5 ~ 20 MHz (0.1Vp-p, min.). When the mode is shifted to FM, the AM terminal voltage automatically becomes the supply voltage of device.
10	GND	Ground terminal.
11	E01	When the divided oscillation frequency is higher than the standard frequency, H-level output is delivered from these terminals. When it is lower, L-level (0V) output is delivered. When they coincide, it results in floating.
12	E02	
13	CE	Device selection signal input terminal. The signal level should be high when the device is operated, and low when not operated. With this terminal shifted to low level, LCD (liquid crystal display) turns off and the memory is held.
14	NC	Not used in this unit.
15	X1	Connecting terminal for crystal oscillator. The crystal connected is at 4.5 MHz.
16	X2	
17	A3 (SD)	Terminal to put in stop signal during auto tuning. The voltage is 5V with broadcast received, and 0V without broadcast received.
18	A2	Not used in this unit.
19	A1	FM/AM output terminal. (FM ⟶ 5V, AM ⟶ 0V)
20	A0	Auto/mono changeover output terminal. (auto ⟶ 0V, mono ⟶ 5V)
21 ⟆ 24	K3 ⟆ K0	Input terminal for key return signal from external key matrix. 
25 ⟆ 28	B3 ⟆ B0	Input terminal for key return signal from external key matrix. 
29	C3	Output terminal for key return signal to let the stereo indicator light up. 
30	C2	AF output signal detection terminal. When AF output is higher than AC 2V, Q904 turns ON and key return signal is put into No. 24 pin.
31	C1	TV/FM/AM output terminal (TV ⟶ 5V, FM ⟶ 0V, AM ⟶ 0V).
32	C0	Muting signal output terminal. Muting signal is put out during operation of FM/AM selector switch and tuning switch. (4V during muting)

• TV stereo/audio II decoder IC (IC401)

Pin No.	Mark	Descripiton of terminals
1	MPX IN	Composite signal input terminal. Composite signal is input from this terminal. The level is 0.7Vp-p (247mVrms, −9.9 dBs) in monaural 100% (± 25 kHz).
2	NC	Not used in this unit.
3	STEREO FILTER ADJ.	Cut-off frequency adjusting terminal. With stereo low pass filter, L + R low pass filter, and L − R/AUDIO II low pass filter interlocked, cut-off frequency is adjusted by VR402.
4	AUDIO II FILTER ADJ.	Cut-off frequency adjusting terminal. AUDIO II band pass filter, AUDIO II low pass filter cut-off frequency adjusting terminal.
5	BIAS	Terminal for fine adjustment of bias current in AUDIO II band pass filter. Usually the terminal is open in use.
6	AUDIO II BPF OUT	AUDIO II band pass filter output terminal.
7	NC	Not used in this unit.
8	AUDIO II DET IN	AUDIO II detection circuit input terminal. AUDIO II band pass filter output is input by capacitor connected.
9	REG OUT	Stabilizing power supply output terminal. Supply voltage 6.6V is output.
10	AUDIO II VCO ADJ.	AUDIO II detector VCO adjusting terminal. AUDIO II detector VCO is adjusted to 5 fH (78.68 kHz) by use of this terminal. Actually, it is adjusted with DC voltage of pin ㉕.
11	CARR DET.	AUDIO II carrier detection (AM detection) circuit output terminal. Capacitor is connected to this terminal for smoothing AUDIO II is detected with the DC voltage. When the signal of AUDIO II is received, voltage 3.8V ~ 4.8V is output. When there is no signal of AUDIO II, voltage 2V is output.
12	AUDIO II GND	Ground terminal of AUDIO II block.
13	AUDIO II SQH INHBIT	When there is no carrier of AUDIO II, SKELTCH functions for muting operation.
14	AUDIO II MUTE	AUDIO II muting terminal. When the level of this terminal goes H (2.5V ~ 5.5V), the output of pin ㉕ (AUDIO II OUT) is muted.
15	MUTE	Muting terminal. When the level of this terminal goes H (2.5V ~ 5.5V), the outputs of pins ㉒ and ㉓ (LINE OUT) are muted.
16	MS−1	Mode switch. When the level of this terminal goes L (0V), the mode switches (SW1, SW2) in IC are shifted to AUDIO II. This is used in combination with MS−0 of pin ⑰.
17	MS−0	Mode switch. When the level of this terminal goes H (2.5V ~ 5.5V), the mode switch (SW1, SW2) in IC are shifted to AUDIO II position. This is used combination of MS−1 of pin ⑯.
18	AUDIO II IND DRIVE	AUDIO II indicator drive terminal. When AUDIO II broadcast is detected, it drive the indicator. When AUDIO II signal is received, the level goes L (0.7V ~ 1.0V).
19	STEREO IND DRIVE	TV stereo indicator drive terminal. When TV stereo broadcast is detected, it drive the indicator. When TV stereo signal is received, the level goes L (0.7V ~ 1.0V).
20	FORCED MONAURAL	Forced Monaural input terminal. Three-value input terminal: stereo operation in L level "GND ~ 1V", monaural operation (stereo indicator in normal operation) in M level (2.5V ~ 5.5V), and stereo indicator output as well as monaural operation are inhibited.
21	LED GND	Ground terminal for AUDIO II, TV stereo indicator.
22	LINE OUT L	L-channel output terminal. The standard level of output is 1.3Vp-p when 0.7Vp-p is input to pin①.

Pin No.	M
23	LINE
24	(L−R AUD
25	AUDI
26	AUDI SW IN
27	MATI L−R/
28	MATI L + R
29	L + R OUT
30	PILOT
31	PILOT
32	ST. V
33	STER
34	STER
35	PHAS
36	PHAS
37	STER LPF C
38	
39	
40	(L − O
41	(L −
42	V

f earth,
als and
device.
ltage to
ernally.
nust be
supply
utput is
oating.
evice is
emory
ceived,
5.2msec
5V
0V
0.5msec
.2msec
5V
0V
0.5msec
2msec.
5V
0V
elector

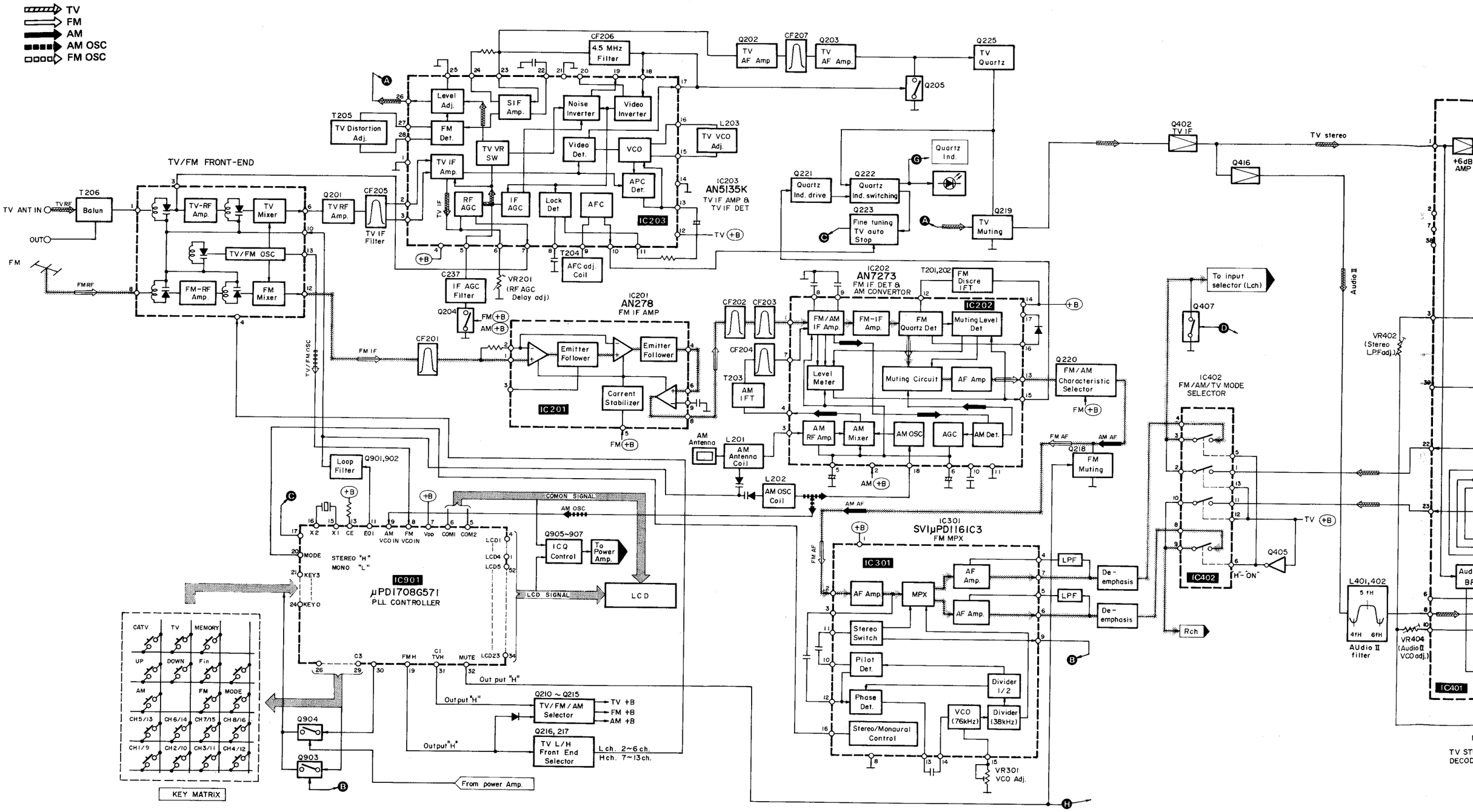
• TV stereo/audio II decoder IC (IC401)

Pin No.	Mark	Descripiton of terminals
1	MPX IN	Composite signal input terminal. Composite signal is input from this terminal. The level is 0.7Vp-p (247mVrms, −9.9 dBs) in monaural 100% (± 25 kHz).
2	NC	Not used in this unit.
3	STEREO FILTER ADJ.	Cut-off frequency adjusting terminal. With stereo low pass filter, L + R low pass filter, and L − R/AUDIO II low pass filter interlocked, cut-off frequency is adjusted by VR402.
4	AUDIO II FILTER ADJ.	Cut-off frequency adjusting terminal. AUDIO II band pass filter, AUDIO II low pass filter cut-off frequency adjusting terminal.
5	BIAS	Terminal for fine adjustment of bias current in AUDIO II band pass filter. Usually the terminal is open in use.
6	AUDIO II BPF OUT	AUDIO II band pass filter output terminal.
7	NC	Not used in this unit.
8	AUDIO II DET IN	AUDIO II detection circuit input terminal. AUDIO II band pass filter output is input by capacitor connected.
9	REG OUT	Stabilizing power supply output terminal. Supply voltage 6.6V is output.
10	AUDIO II VCO ADJ.	AUDIO II detector VCO adjusting terminal. AUDIO II detector VCO is adjusted to 5 fH (78.68 kHz) by use of this terminal. Actually, it is adjusted with DC voltage of pin ㉕.
11	CARR DET.	AUDIO II carrier detection (AM detection) circuit output terminal. Capacitor is connected to this terminal for smoothing AUDIO II is detected with the DC voltage. When the signal of AUDIO II is received, voltage 3.8V ∼4.8V is output. When there is no signal of AUDIO II, voltage 2V is.output.
12	AUDIO II GND	Ground terminal of AUDIO II block.
13	AUDIO II SQH INHBIT	When there is no carrier of AUDIO II, SKELTCH functions for muting operation.
14	AUDIO II MUTE	AUDIO II muting terminal. When the level of this terminal goes H (2.5V ∼5.5V), the output of pin ㉕ (AUDIO II OUT) is muted.
15	MUTE	Muting terminal. When the level of this terminal goes H (2.5V ∼5.5V), the outputs of pins ㉒ and ㉓ (LINE OUT) are muted.
16	MS−1	Mode switch. When the level of this terminal goes L (0V), the mode switches (SW1, SW2) in IC are shifted to AUDIO II. This is used in combination with MS−0 of pin ⑰.
17	MS−0	Mode switch. When the level of this terminal goes H (2.5V ∼5.5V), the mode switch (SW1, SW2) in IC are shifted to AUDIO II position. This is used combination of MS−1 of pin ⑯.
18	AUDIO II IND DRIVE	AUDIO II indicator drive terminal. When AUDIO II broadcast is detected, it drive the indicator. When AUDIO II signal is received, the level goes L (0.7V ∼1.0V).
19	STEREO IND DRIVE	TV stereo indicator drive terminal. When TV stereo broadcast is detected, it drive the indicator. When TV stereo signal is received, the level goes L (0.7V ∼1.0V).
20	FORCED MONAURAL	Forced Monaural input terminal. Three-value input terminal: stereo operation in L level "GND ∼1V", monaural operation (stereo indicator in normal operation) in M level (2.5V ∼5.5V), and stereo indicator output as well as monaural operation are inhibited.
21	LED GND	Ground terminal for AUDIO II, TV stereo indicator.
22	LINE OUT L	L-channel output terminal. The standard level of output is 1.3Vp-p when 0.7Vp-p is input to pin①.

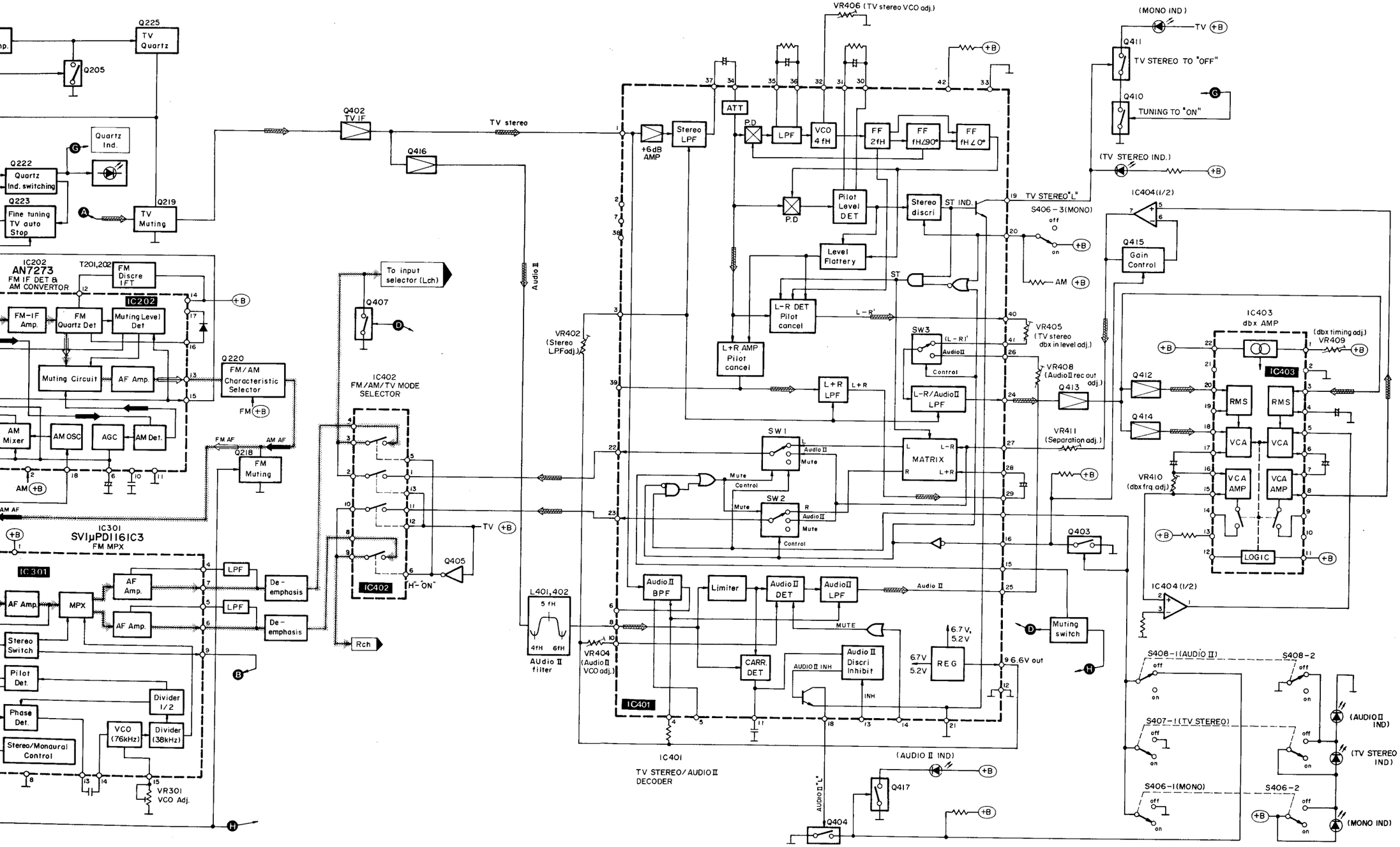
Pin No.	Mark	Description of temrinals
23	LINE OUT R	R-channel output terminal. Level and gain are the same as for pin ㉒.
24	(L−R)′/ AUDIO II′ OUT	Output terminal with (L − R)′ and AUDIO II selected according to the mode and passed through low pass filter. This is connected to noise reduction circuit.
25	AUDIO II′ OUT	Output terminal of FM detector of AUDIO II.
26	AUDIO II′ SW IN	Output of pin ㉕ AUDIO II′ OUT is input to this terminal. Either L − R′ signal from pin ㊶ or this signal is selected by SW3, and the signal passes through low pass filter and is output to pin ㉔. The standard input level of AUDIO II to noise reduction circuit can be adjusted by adjusting the input level to this terminal.
27	MATRIX L−R/AUDIO II IN	Noise reduction input terminal. Output of noise reduction circuit is input to this terminal. Input level is adjusted by VR411 so that the separation is maximized.
28	MATRIX L + R IN	Output signal of pin ㉕ is input to pin ㉘ through external deemphasis circuit.
29	L + R OUT	Output terminal of L + R.
30	PILOT DET −	Pilot level detection output terminal.
31	PILOT DET +	
32	ST. VCO ADJ.	Stereo VCO adjusting terminal. VCO is adjusted to 62.94 kHz ± 0.05 kHz by VR406.
33	STEREO GND	Ground terminal of stereo block.
34	STEREO IN	Output (pin ㊲) of stereo low pass filter is input to this terminal.
35	PHASE DET −	PLL low pass filter connecting terminals.
36	PHASE DET +	PLL low pass filter is connected between pins ㉟ and ㊱ .
37	STEREO LPF OUT	Output terminal of stereo low pass filter.
38	NC	Not used in this unit.
39	TP	L + R AMP./Pilot cancel circuit output monitor terminal. Not used in this unit.
40	(L − R)′ DET OUT	Output terminal that detects synchronizing of SUB (L − R)′.
41	(L − R)′ SW IN	Signal of pin ㊵ is input to this terminal Either the signal of AUDIO II′ input from pin ㉖ or this signal is selected by SW3, and the signal passes through low pass filter and is output to pin ㉔.
42	Vcc	Power supply terminal. +9V is applied.

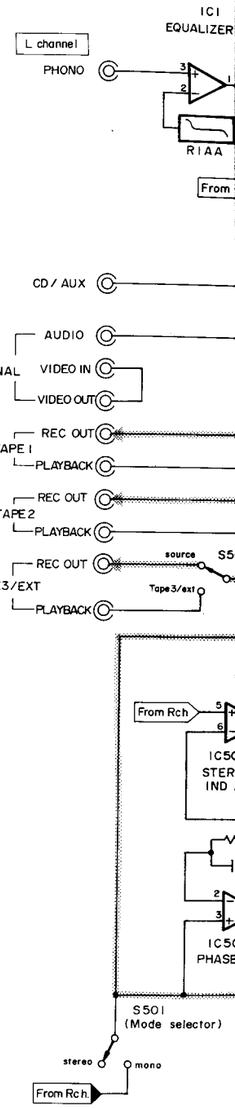
■ BLOCK DIAGRAM

- **Tuner circuit**



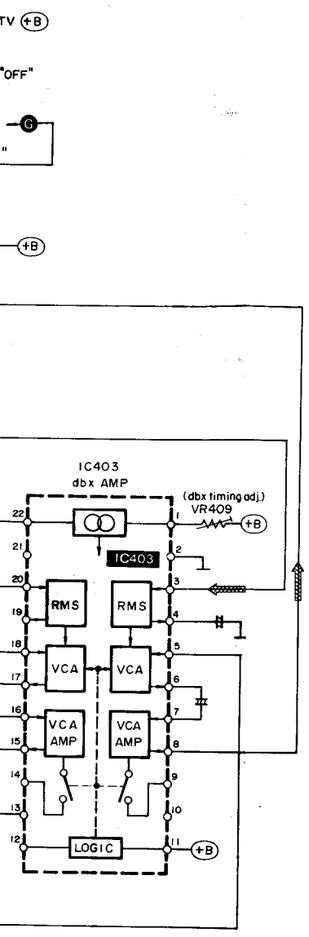
• Amplifier circuit

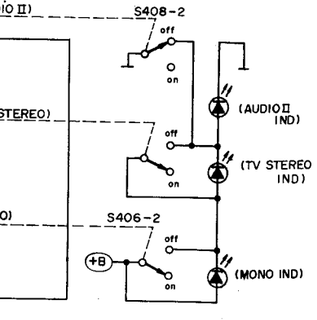


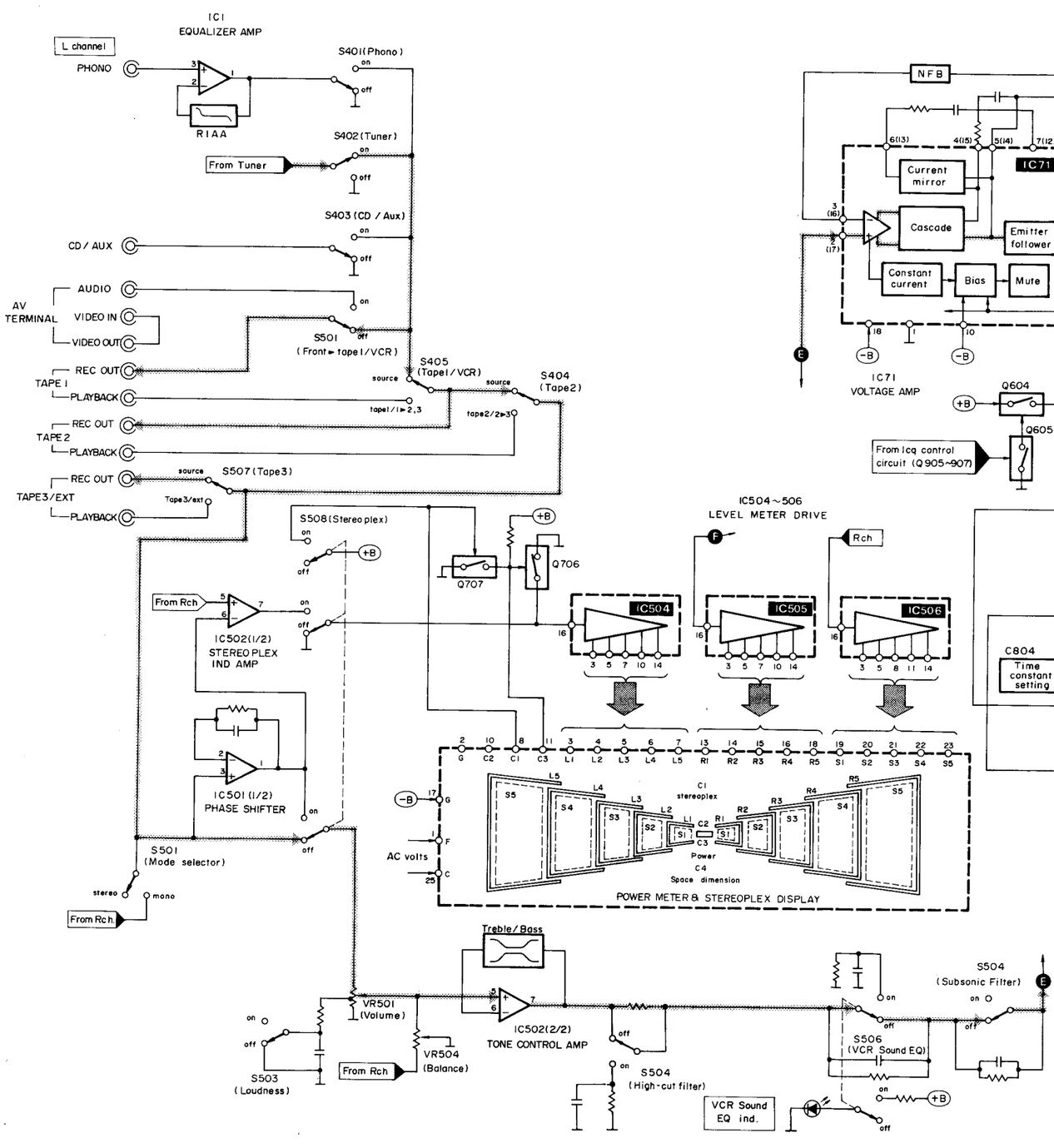


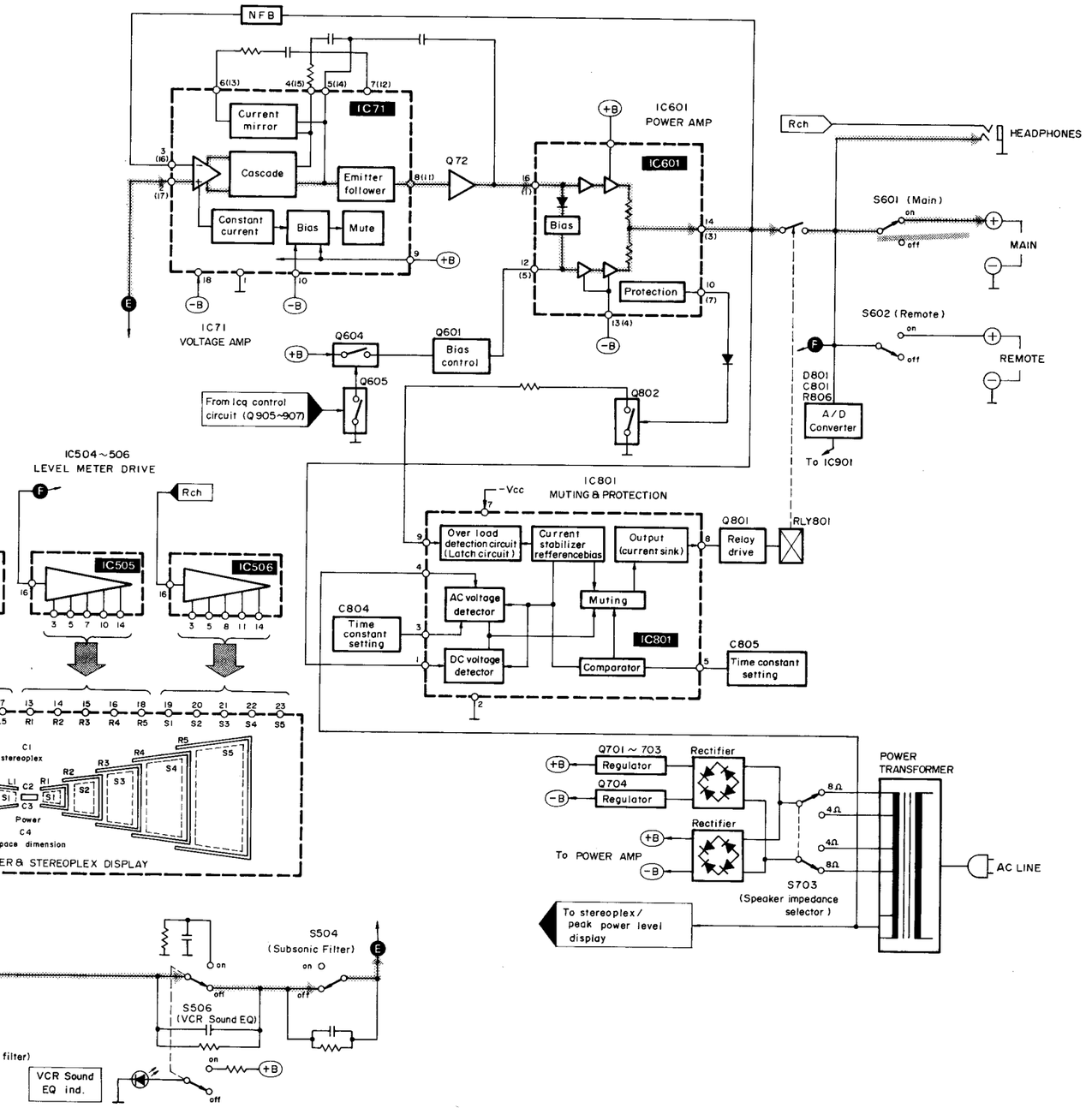
SA-560/SA-956

• Amplifier circuit









■ OPERATIONAL DESCRIPTION OF IC801 FOR MUTING

1. Muting operation with power ON

(1) When power is turned ON, AC voltage is applied to No. 4 pin of IC801.
(2) Next, the time constant setting capacitor (C805) connected to No. 5 pin begins to be charged.
(3) When the voltage reaches about −2.2V (3 seconds after power ON), the muting circuit turns ON, and then −15V voltage is output to No. 8 pin.
(4) When minus voltage is output to No. 8 pin, Q801 turns ON causing speaker protecting relay (RLY801) to turn ON. (Speaker terminal is connected to power amplifier.)

2. Muting operation with power OFF

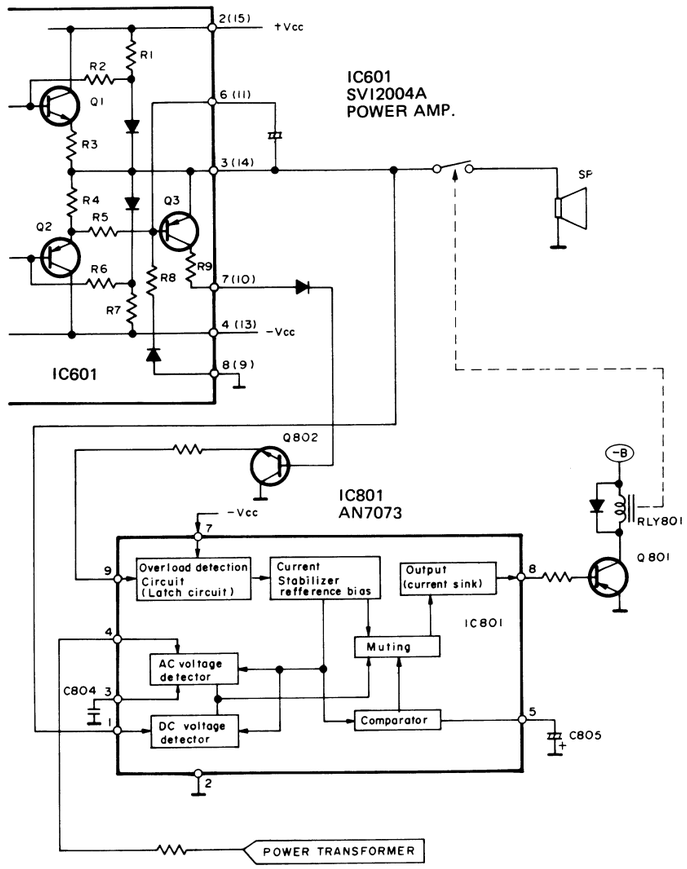
(1) When power is turned OFF, the time constant setting capacitor (C804) connected to No. 3 pin is discharged, then AC detection circuit operates to turn the muting circuit OFF.
(2) When the muting circuit is turned OFF, the voltage of No. 8 pin becomes 0V and speaker protecting relay (RLY801) turns OFF.

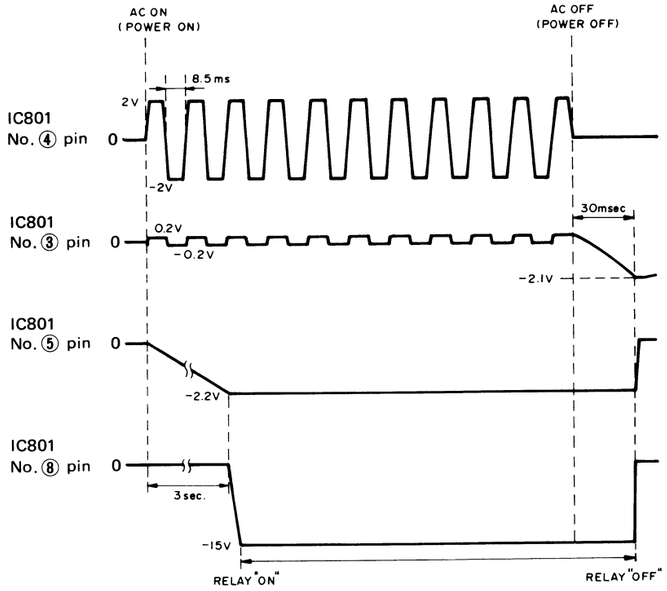
3. Muting operation with power amplifier overloaded.

(1) If speaker terminals are short-circuited or a speaker whose impedance is less than the rating indicated on the unit is used, then a large level current will flow into power transistors Q1 and Q2, causing rise of the voltage across the emitter resistor R4.
(2) When the voltage across R4 is increased, the overload detection transistor Q3 turns ON.
(3) The minus voltage supplied to the bias circuit of IC801 is applied to No. 9 pin of IC801. So, when Q3 turns ON, then Q802 turns ON and the voltage of No. 9 pin becomes nearly 0V. The load shorting detection circuit functions when the potential difference between No. 7 pin and No. 9 pin of IC801 exceeds 0.6V.
(4) If the load shorting detection circuit operates, the muting circuit turns OFF and the speaker protecting relay (RLY801) also turns OFF.

4. Operation of DC detection circuit

(1) If a plus or minus DC voltage comes out of No. 3 (14) pin of IC601, then the DC detection circuit operates, the muting circuit turns OFF and the speaker protecting relay (RLY801) also turns OFF.





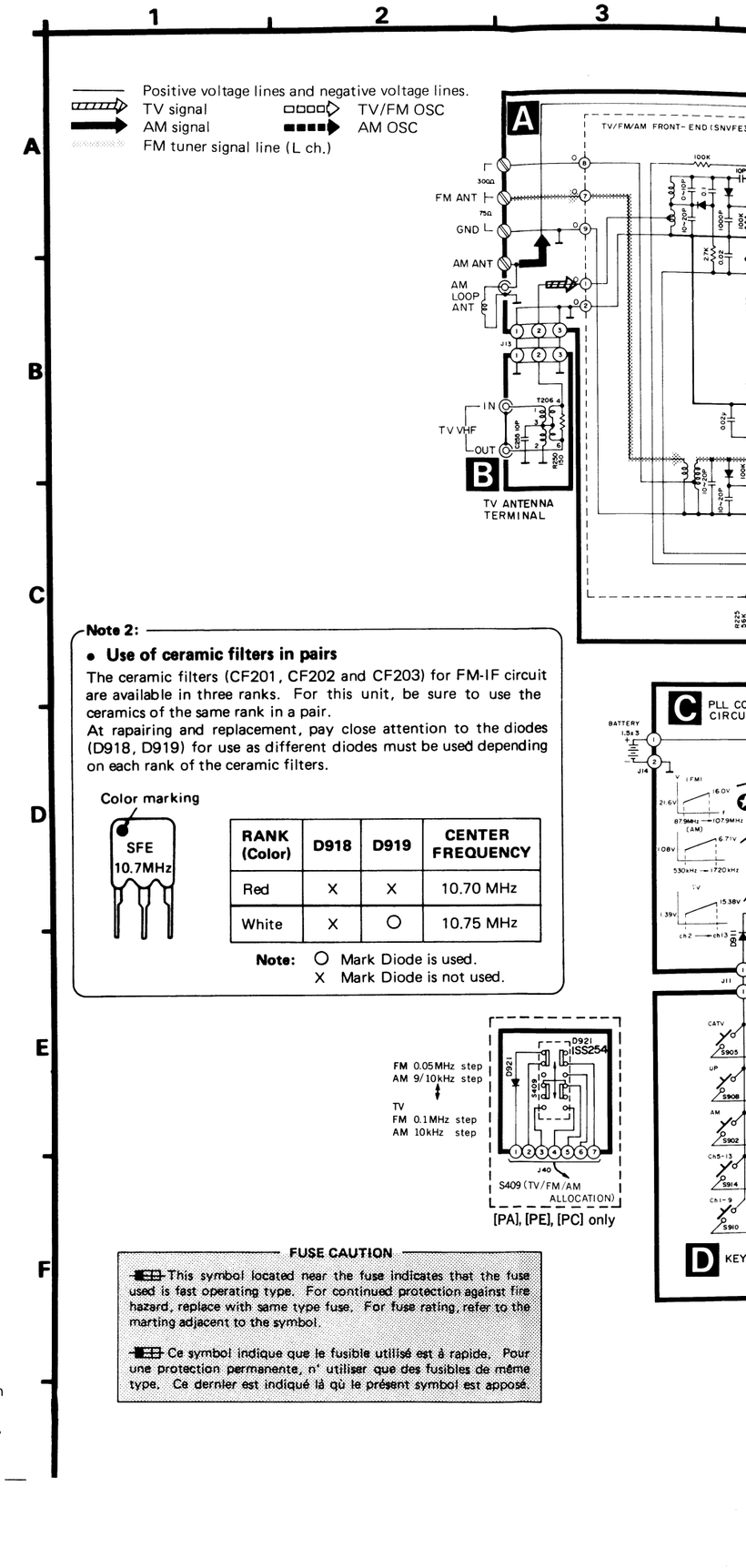
■ SCHEMATIC DIAGRAM

(This schematic diagram may be modified at any time with the development of new technology.)

* The part No. of transistors, IC and diodes mentioned in the schematic diagram stand for production part No. Regarding the part No. with ✪ mark, the production part No. are different from the replacement part No. Therefore, when placing an order for replacement part, please use the part No. in the replacement part list.

Note 1:

- **S401 ~ S403** : Input selector in "**tuner**" position.
  [S401 — phono, S402 — tuner
  S403 — CD/aux]
- **S404** : Tape-monitor selector in "**source**" position.
  source ⟷ tape 2/2 ▶ 3
- **S405** : Tape-monitor selector switch in "**source**" position.
  source ⟷ tape 1/1 ▶ 2, 3
- **S406 ~ S408** : Multiplex TV sound mode selector in "**mono**" position.
- **S409** : TV/FM/AM allocation switch in "**FM 0.05 MHz, AM 9/10 kHz step**" position.
  FM 0.05 MHz step / AM 9/10 kHz step (Except for USA) ⟷ TV / FM 0.1 MHz step / AM 10 kHz step (for USA)
- **S501** : Dubbing switch in "**off**" position.
  off ⟷ on (front ▶ tape 1/VCR)
- **S502** : Mode selector switch in "**stereo**" position.
  stereo ⟷ mono
- **S503** : Loudness switch in "**off**" position.
  off ⟷ on
- **S504** : High-cut filter switch in "**off**" position.
  off ⟷ on
- **S505** : Subsonic filter switch in "**off**" position.
  off ⟷ on
- **S506** : VCR sound equalizer switch in "**off**" position.
  off ⟷ on
- **S507** : Tape-monitor selector in "**source**" position.
  source ⟷ tape 3/ext
- **S508** : Stereoplex switch in "**off**" position.
  off ⟷ on
- **S601** : Main speaker switch in "**on**" position.
  off ⟷ on
- **S602** : Remote speaker switch in "**off**" position.
  off ⟷ on
- **S701** : Power switch in "**on**" position.
- **S702** : Voltage selector switch in "**240V**" position.
  127V⟷110V⟷220V⟷240V
- **S901** : FM mode selector switch.
- **S902 ~ S905** : Band selector switch.
  [S902 — AM, S903 — FM
  S904 — TV, S905 — CATV]
- **S906** : Fine tuning switch.
- **S907, S908** : Tuning switch.
  [S907 — down (tuning to lower frequency)
  S908 — up (tuning to higher frequency)]
- **S909** : Memory switch. (manual ⟷ auto)
- **S910 ~ S917** : Preset tuning switch.
  [S910 — CH1/CH9, S911 — CH2/CH10,
  S912 — CH3/CH11, S913 — CH4/CH12,
  S914 — CH5/CH13, S915 — CH6/CH14,
  S916 — CH7/CH15, S917 — CH8/CH16]
- **S918** : Memory scan switch. (start ⟷ stop)
- Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.
  * All voltage values shown in circuitry are DC voltage in FM signal (Monaural signal) reception mode.
  * Figures in < > stand for DC voltage in FM stereo signal reception mode.
  * Figures in ( ) stand for DC voltage in AM signal reception mode.
  * Figures in [ ] stand for DC voltage in TV signal reception mode.
  * Figures in ≪ ≫ stand for DC voltage in audio II signal reception mode.
  * Figures in ▭ stand for DC voltage in protection circuit is on.



Note 2:

- **Use of ceramic filters in pairs**

The ceramic filters (CF201, CF202 and CF203) for FM-IF circuit are available in three ranks. For this unit, be sure to use the ceramics of the same rank in a pair.
At rapairing and replacement, pay close attention to the diodes (D918, D919) for use as different diodes must be used depending on each rank of the ceramic filters.

Color marking

RANK (Color)	D918	D919	CENTER FREQUENCY
Red	X	X	10.70 MHz
White	X	○	10.75 MHz

Note: ○ Mark Diode is used.
X Mark Diode is not used.

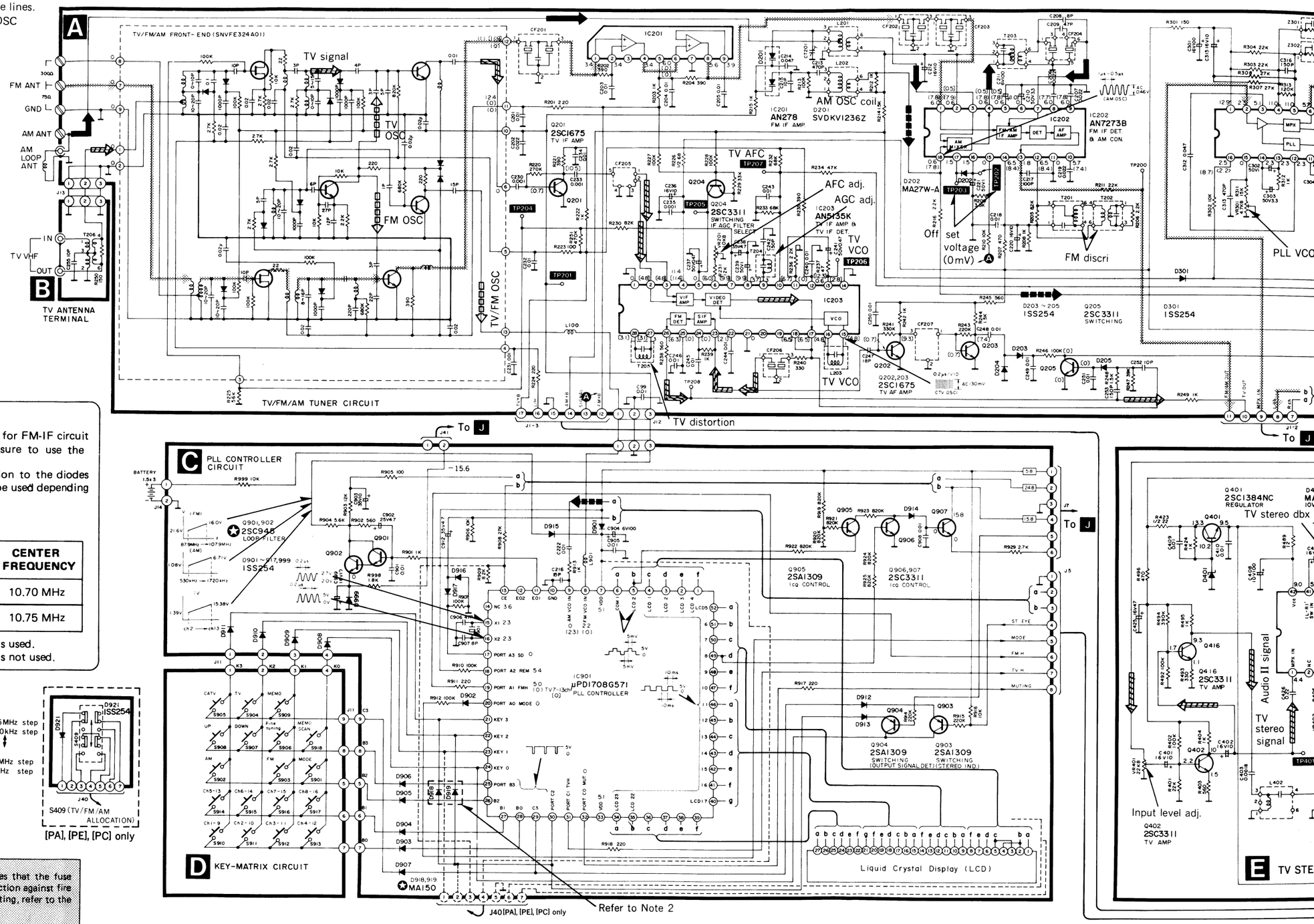
[PA], [PE], [PC] only

FUSE CAUTION

This symbol located near the fuse indicates that the fuse used is fast operating type. For continued protection against fire hazard, replace with same type fuse. For fuse rating, refer to the marting adjacent to the symbol.

Ce symbol indique que le fusible utilisé est à rapide. Pour une protection permanente, n' utiliser que des fusibles de même type. Ce dernier est indiqué là qù le présent symbol est apposé.

Positive voltage lines and negative voltage lines.
TV signal
AM signal
FM tuner signal line (L ch.)
TV/FM OSC
AM OSC

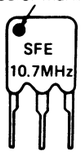


Note 2:

- **Use of ceramic filters in pairs**

The ceramic filters (CF201, CF202 and CF203) for FM-IF circuit are available in three ranks. For this unit, be sure to use the ceramics of the same rank in a pair.
At rapairing and replacement, pay close attention to the diodes (D918, D919) for use as different diodes must be used depending on each rank of the ceramic filters.

Color marking



RANK (Color)	D918	D919	CENTER FREQUENCY
Red	X	X	10.70 MHz
White	X	O	10.75 MHz

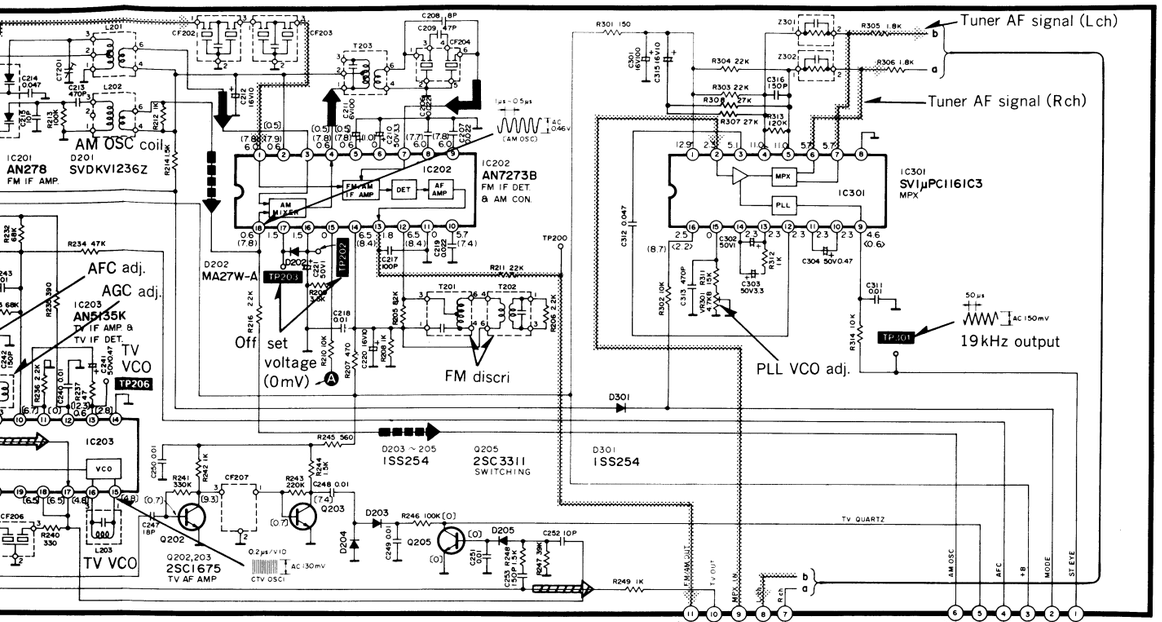
Note: O Mark Diode is used.
X Mark Diode is not used.

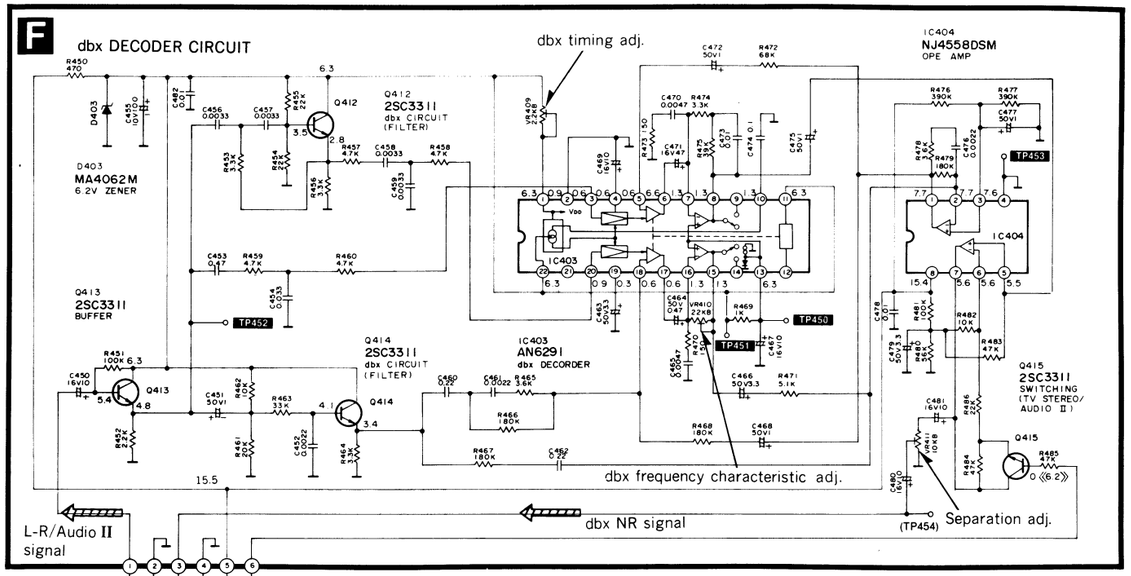
[PA], [PE], [PC] only

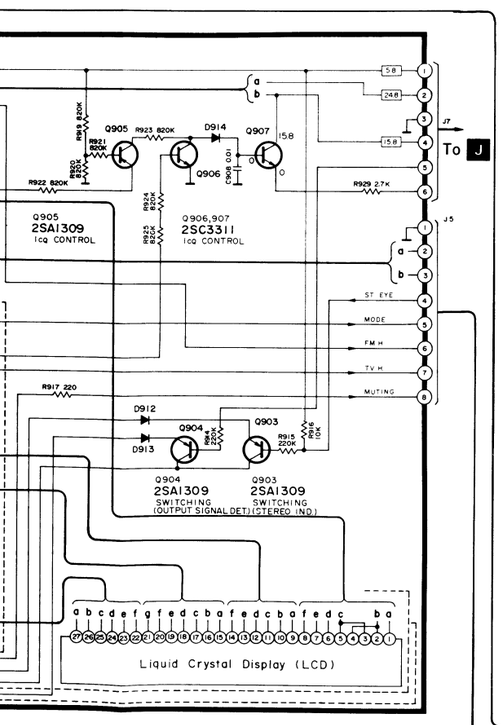
FUSE CAUTION

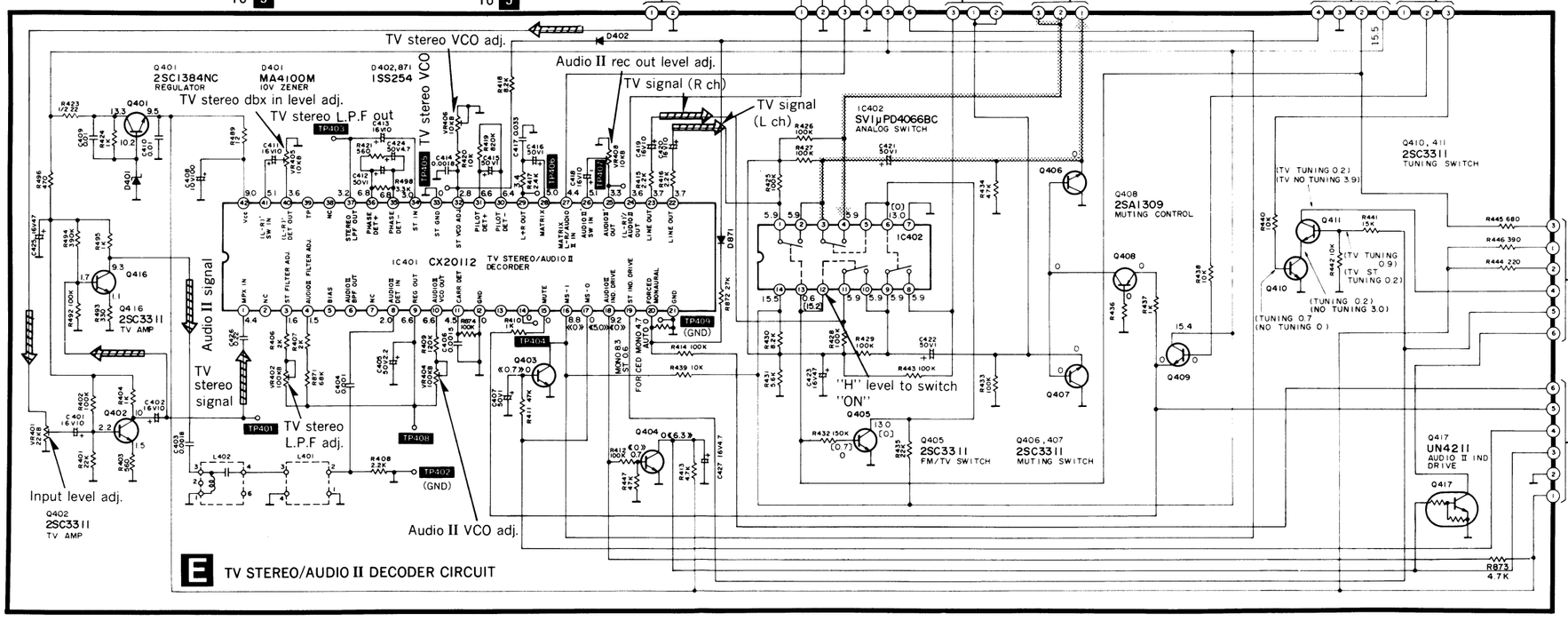
This symbol located near the fuse indicates that the fuse used is fast operating type. For continued protection against fire hazard, replace with same type fuse. For fuse rating, refer to the marting adjacent to the symbol.

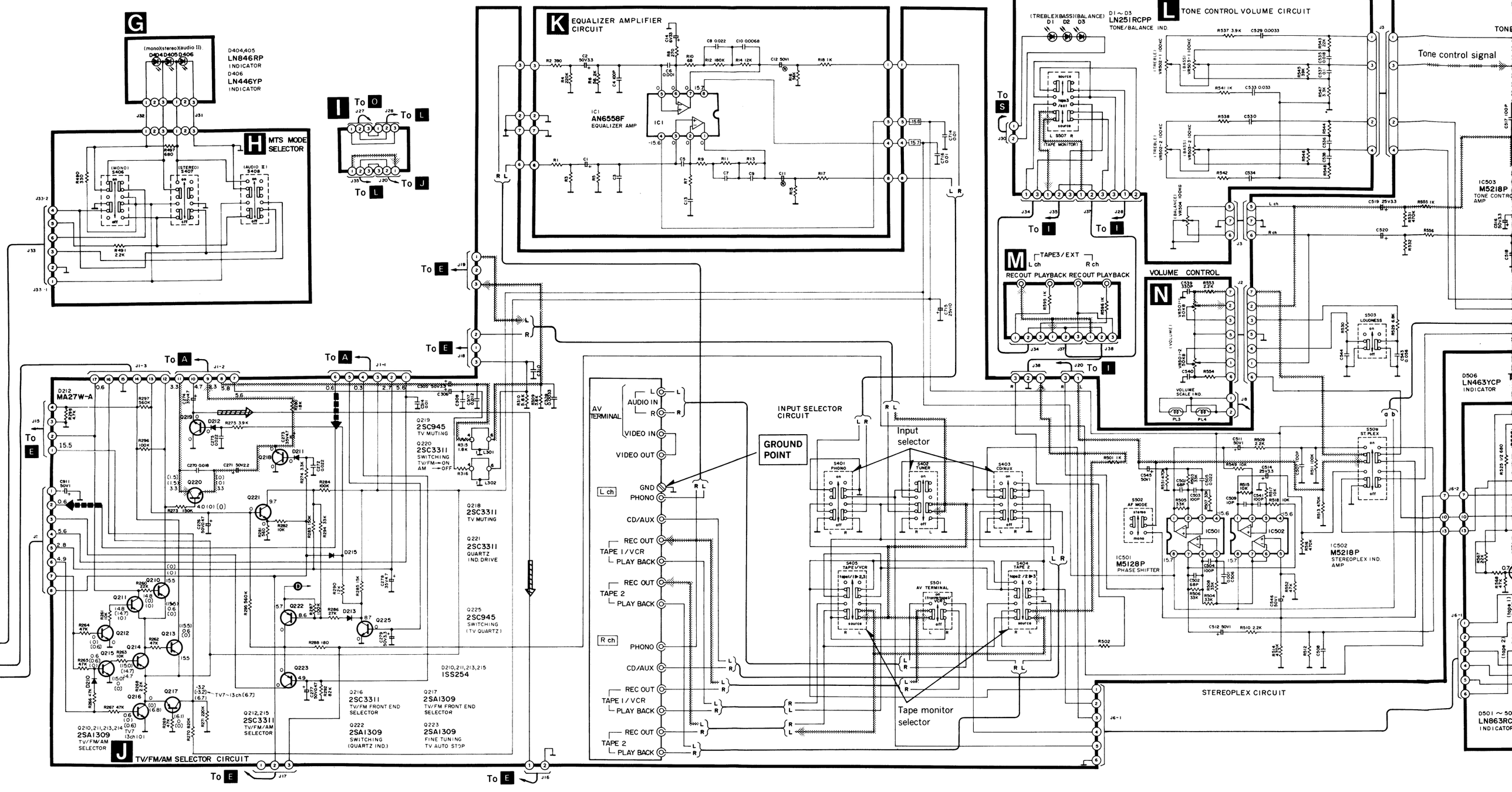
Ce symbol indique que le fusible utilisé est à rapide. Pour une protection permanente, n' utiliser que des fusibles de même type. Ce dernier est indiqué là qù le présent symbol est apposé.


AM OSC coil
IC201 AN278 FM IF AMP
D201 SVDKV1236Z
IC202 AN7273B FM IF DET. & AM CON.
AFC adj.
AGC adj.
IC203 AN5135K TV IF AMP & TV IF DET.
TV VCO
Off set voltage (0mV)
FM discri
TV VCO
Q202 2SC1675 TV AF AMP
CTV OSC.
D203 ~ 205 1SS254
Q205 2SC3311 SWITCHING
D301 1SS254
Tuner AF signal (Lch)
Tuner AF signal (Rch)
IC301 SVIμPC1161C3 MPX
PLL VCO adj.
19kHz output
TV QUARTZ
To J


F
dbx DECODER CIRCUIT
dbx timing adj.
IC404 NJ4558DSM OPE AMP
D403 MA4062M 6.2V ZENER
Q412 2SC3311 dbx CIRCUIT (FILTER)
Q413 2SC3311 BUFFER
Q414 2SC3311 dbx CIRCUIT (FILTER)
IC403 AN6291 dbx DECORDER
Q415 2SC3311 SWITCHING (TV STEREO/ AUDIO II)
dbx frequency characteristic adj.
dbx NR signal
L-R/Audio II signal
Separation adj.
(TP454)
J25


Q905 2SA1309 IcQ CONTROL
Q906,907 2SC3311 IcQ CONTROL
Q904 2SA1309 SWITCHING (OUTPUT SIGNAL DET)
Q903 2SA1309 SWITCHING (STEREO IND.)
ST EYE
MODE
FM H
TV H
MUTING
Liquid Crystal Display (LCD)
To J


TV stereo VCO adj.
Audio II rec out level adj.
TV signal (R ch)
TV signal (L ch)
TV stereo dbx in level adj.
TV stereo L.P.F out
Q401 2SC1384NC REGULATOR
D401 MA4100M 10V ZENER
D402,871 1SS254
IC402 SVIμPD4066BC ANALOG SWITCH
IC401 CX20112 TV STEREO/AUDIO II DECORDER
Audio II signal
TV stereo signal
TV stereo L.P.F adj.
Input level adj.
Audio II VCO adj.
"H" level to switch "ON"
Q408 2SA1309 MUTING CONTROL
Q405 2SC3311 FM/TV SWITCH
Q406,407 2SC3311 MUTING SWITCH
Q410,411 2SC3311 TUNING SWITCH
Q417 UN4211 AUDIO II IND DRIVE
E TV STEREO/AUDIO II DECODER CIRCUIT
To O


G
(mono)(stereo)(audio II)
D404,405
LN846RP
INDICATOR
D406
LN446YP
INDICATOR
H MTS MODE SELECTOR
I
J TV/FM/AM SELECTOR CIRCUIT
K EQUALIZER AMPLIFIER CIRCUIT
IC1
AN6558F
EQUALIZER AMP
L TONE CONTROL VOLUME CIRCUIT
D1 ~ D3
LN251RCPP
TONE/BALANCE IND.
Tone control signal
IC503
M5218P
TONE CONTRO
AMP
M TAPE3/EXT
L ch R ch
RECOUT PLAYBACK RECOUT PLAYBACK
N VOLUME CONTROL
D506
LN463YCP
INDICATOR
AV TERMINAL
AUDIO IN
VIDEO IN
VIDEO OUT
GND
PHONO
CD/AUX
REC OUT
TAPE 1/VCR
PLAY BACK
TAPE 2
INPUT SELECTOR CIRCUIT
GROUND POINT
Input selector
Tape monitor selector
STEREOPLEX CIRCUIT
IC501
M5128P
PHASE SHIFTER
IC502
M5218P
STEREOPLEX IND. AMP
D212
MA27W-A
TV/FM/AM SELECTOR
D210,211,213,215
ISS254
Q210,211,213,214
2SA1309
TV/FM/AM SELECTOR
Q212,215
2SC3311
TV/FM/AM SELECTOR
Q216
2SC3311
TV/FM FRONT END SELECTOR
Q217
2SA1309
TV/FM FRONT END SELECTOR
Q218
2SC3311
TV MUTING
Q219
2SC945
TV MUTING
Q220
2SC3311
SWITCHING TV/FM→ON AM →OFF
Q221
2SC3311
QUARTZ IND. DRIVE
Q222
2SA1309
SWITCHING (QUARTZ IND.)
Q223
2SA1309
FINE TUNING TV AUTO STOP
Q225
2SC945
SWITCHING (TV QUARTZ)
To A
To E
To I
To J
To L
To O
To S

L TONE CONTROL VOLUME CIRCUIT

D1 ~ D3
LN251RCPP
TONE/BALANCE IND.

TONE CONTROL CIRCUIT

Tone control signal

Tone control signal

IC503
M5218P
TONE CONTROL AMP

S504
high filter

S505
SUBSONIC

S506
VCR SOUND EQ

N VOLUME CONTROL

S503
LOUDNESS

VOLUME SCALE IND.

S501a
ST. FLEX

S502
AF MODE

IC501
M5128P
PHASE SHIFTER

IC502
M5218P
STEREOPLEX IND. AMP

STEREOPLEX CIRCUIT

D506
LN463YCP
INDICATOR

D214,407,408
LN846RP
INDICATOR

D409
LN446YP
INDICATOR

D507
LN463YCP
INDICATOR

Q706,707,710
2SC3311QRS
SELECTOR
(STEREOPLEX/PEAK POWER METER)

IC504~506
SVIBA6148
LEVEL METER DRIVE

D573,574
ISS254

D575~578
ISS254

D501~505
LN863RCPP
INDICATOR

Stereoplex/peak power level indicator

FL SADB6247Z

O STEREOPLEX/PEAK POWER LEVEL INDICATOR CIRCUIT

P VOLTAGE AMPLIFIER CIRCUIT

D71,72
MA162A

Q72

IC601
SVI2004A
POWER AMP

IC71
AN7062
VOLTAGE AMP

Q71,72
2SA1123
VOLTAGE AMP

Q701
2SD1265
REGULATOR

Q702
2SC3311
REGULATOR

Q703
2SC1685
REGULATOR

D705
MA4062M
6.2V ZENER

IC801
AN7073
MUTING/DC DET/SPEAKER PROTECTION

D706
MA2240B
24V ZENER

Q704
2SA1123
REGULATOR

D707
MA4160L
16V ZENER

Q705
2SD1265
REGULATOR

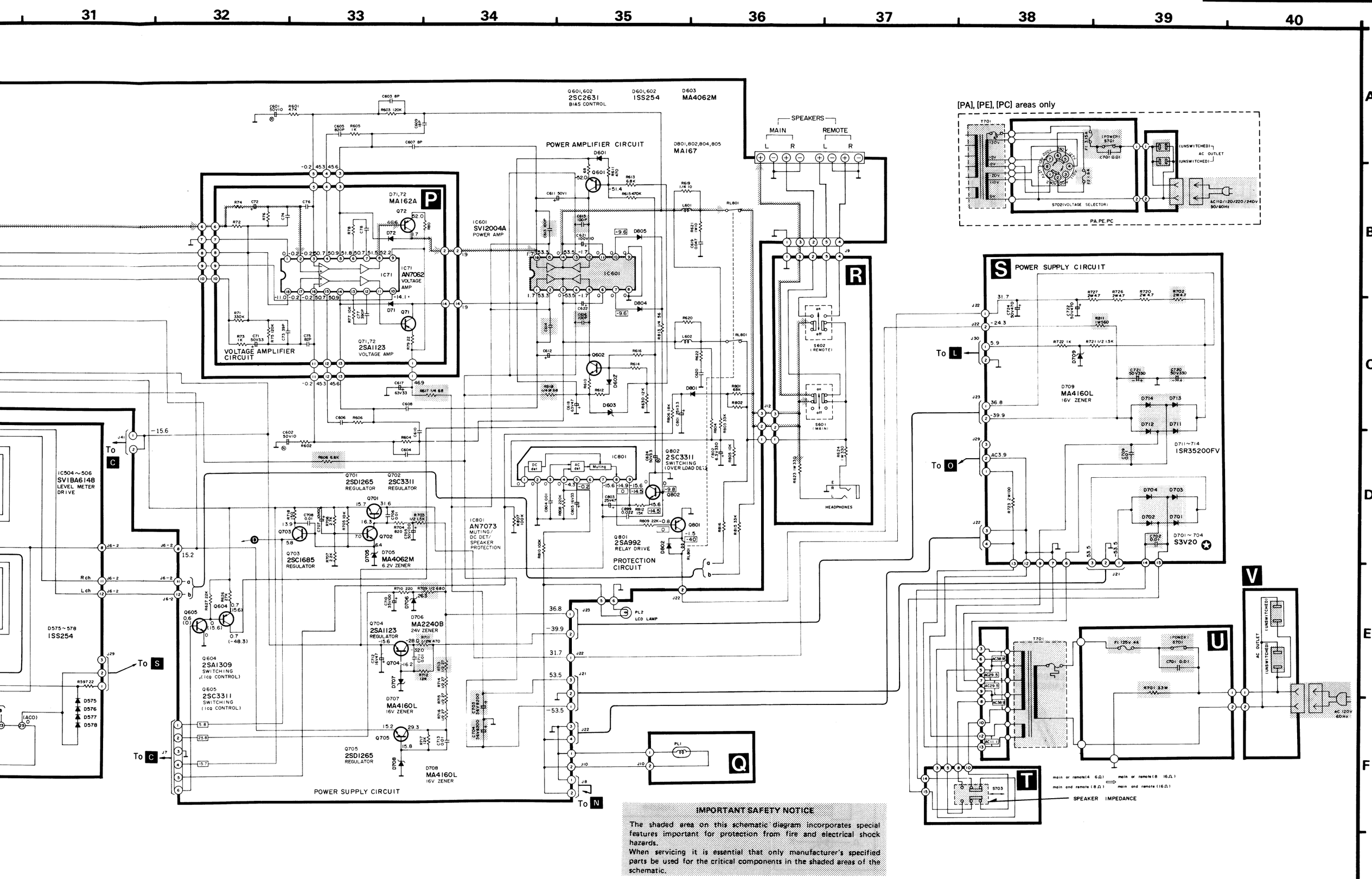
D708
MA4160L
16V ZENER

Q604
2SA1309
SWITCHING (ICQ CONTROL)

Q605
2SC3311
SWITCHING (ICQ CONTROL)

POWER SUPPLY CIRCUIT

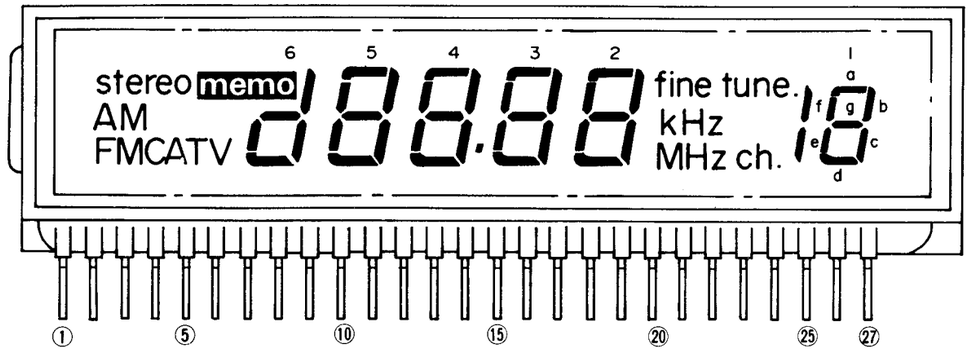
To I
To C
To S
To E
To D



IMPORTANT SAFETY NOTICE

The shaded area on this schematic diagram incorporates special features important for protection from fire and electrical shock hazards.
When servicing it is essential that only manufacturer's specified parts be used for the critical components in the shaded areas of the schematic.

■ DESCRIPTION OF LCD PANEL

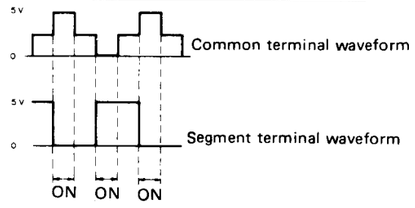


Common terminal — ①, ④ Segment terminal — ⑤ ~ ㉗

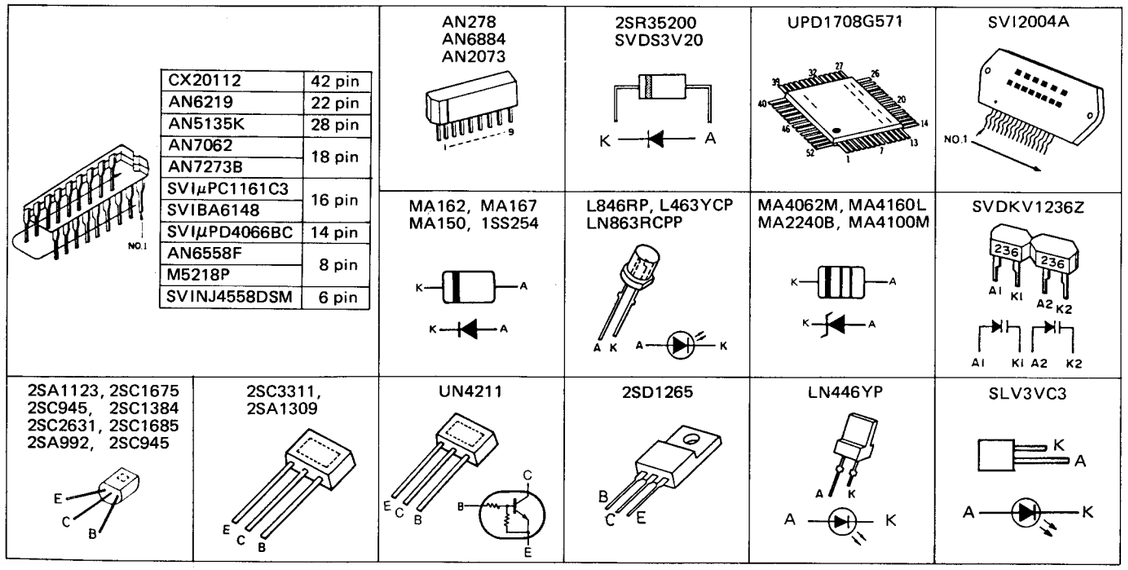
No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
COM 1	COM 1	NC	NC	—	memo	AM	FM,MHz	6b	5f	5e	5d	5a	4f	4e
COM 2	—	NC	NC	COM 2	CA	TV	6d,e,g	6c	5b	5g	5c	—	4b	4g

No.	15	16	17	18	19	20	21	22	23	24	25	26	27
COM 1	4d	4a	3f	3e	3d	3a	2a,c,d,f	kHz	stereo	ch	1d	1e	1f
COM 2	4c	▰	3b	3g	3c	2b,e	2g	finetune	/	1a	1c	1g	1b

Lighting timing:
It turns on when the difference in voltage between common and segment terminals is 5V (VDD).



■ TERMINAL GUIDE OF TRANSISTORS, DIODES AND IC'S



■ REPLACMENT PARTS LIST

Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts order.
2. Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. The "Ⓢ" mark is service standard parts and may differ from production parts.
4. Bracketed indications in Ref. No. columns specify the area.
5. The parenthesized numbers in the column of description stand for the quantity per set.
6. Ⓚ-marked parts are used for black only while ○-marked parts are for silver type only.
7. Part other than Ⓚ-and ○-marked are used for both black and silver type.

Ref. No.		Part No.	Description
INTEGRATED CIRCUITS			
IC1		AN6558F	Integrated Circuit
IC71		AN7062N	Integrated Circuit
IC201		AN278	Integrated Circuit
IC202		AN7273B	Integrated Circuit
IC203		AN5135K	Integrated Circuit
IC301		SVIμPC1161C3	Integrated Circuit
IC401		CX20112	Integrated Circuit
IC402		SVIμPD4066BC	Integrated Circuit
IC403		AN6291	Integrated Circuit
IC404		SVINJ4558DSM	Integrated Circuit
IC501, 502		M5218P	Integrated Circuit
IC503		M5218P	Integrated Circuit
IC504		SVIBA6148	Integrated Circuit
IC505, 506		SVIBA6148	Integrated Circuit
IC601	⚠	SVI2004A	Integrated Circuit
IC801		AN7073	Integrated Circuit
IC901		UPD1708G571	Integrated Circuit
TRANSISTORS			
Q71, 72	Ⓢ	2SA1123−R	Transistor
Q201~203	Ⓢ	2SC1675L1	Transistor
Q204, 205, 212, 215, 216, 218, 220, 221, 605, 702, 802, 906, 907		2SC3311−Q	Transistor
Q210, 211, 213, 214, 217, 222, 223, 604, 903~905		2SA1309Q	Transistor
Q219, 225, 901 902	Ⓢ	2SC1815Y	Transistor (Product part No. is 2SC945)
Q401		2SC1384NC−R	Transistor
Q402~407		2SC3311−Q	Transistor
Q408		2SA1309Q	Transistor
Q409~416		2SC3311−Q	Transistor
Q417		UN4211	Transistor
Q601, 602		2SC2631−R	Transistor
Q701, 705		2SD1265−O	Transistor
Q703	Ⓢ	2SC1685−QNC	Transistor
Q704	Ⓢ	2SA1123−R	Transistor
Q706, 707		2SC3311−Q	Transistor
Q710		2SC3311−Q	Transistor
Q801		2SA992E	Transistor
DIODES			
D1~3		LN251RCPP	LED
D71, 72	Ⓢ	MA162A	Diode
D201		SVDKV1236Z	Rectifier
D202, 212		MA27W−A	Diode
D203~205, 210, 211, 213, 215, 301, 601, 602, 901~917		MA165	Diode
D214		LN846RP	LED

Ref. No.		Part No.	Description
DIODES			
D401		MA4100M	Diode
D402		MA165	Diode
D403		MA4062−M	Diode
D404, 405		LN846RP	LED
D406, 409		LN446YP	LED
D407, 408		LN846RP	LED
D501~505		LN863RCPP	LED
D506		LN463YCP	LED
D507		LN463YCP	LED
D573, 574		MA165	Diode
D575~578		MA165	Diode
D603		MA4062−M	Diode
D701~704	⚠	SVDS3V40	Diode
D705		MA4062M	Diode
D706		MA2240B	Diode
D707, 708		MA4160−L	Diode
D709		MA4160−L	Diode
D711~714	⚠	1SR35200	Diode
D801, 802, 804, 805		MA167	Diode
D871		MA165	Diode
D918, 919	Ⓢ	MA162A	Diode
D921 [PA, PE, PC]		MA165	Diode
D999		1SS254	Diode
COILS			
L100		RLQY25S5−O	Choke
L201		SLA2B1−1M	Coil
L202		SL02B7−M	Coil
L203		SL09B1−Z	Coil
L301, 302		SLM1B3−K	Coil
L401		SLM1Z36−1Z	Coil
L402		SLM1B6−1Z	Coil
L601, 602		SLQY07G−30	Choke
L901		ELEPKR22MA	Choke
TRANSFORMERS			
T201		SLI4B511−Z	Transformer
T202		SLI4B513−Z	Transformer
T203		SLI2B101−M	Transformer
T204		SLI9B502−Z	Transformer
T205		SLI9B501−Z	Transformer
T206		SLA9Z3−K	Transformer
T701 [M, MC]	⚠	SLT5N450	Power Source
T701 [other]	⚠	SLT5N451	Power Source
CERAMIC FILTERS			
CF201, 202		SVFE107MM−A	FM, 10.7MHz (Red)
		SVFE107MM−E	FM, 10.75MHz (White)
CF203		SVFE107MX2−A	FM, 10.7MHz (Red)
		SVFE107MX2−E	FM, 10.75MHz (White)
CF204		SVFSFZ450F7L	AM, 450kHz
CF205		SVFAF41MD70Z	Ceramic Filter
CF206, 207		SVFSFS45MA	Ceramic Filter
CRYSTAL			
X901		SVQ43U452−D	Crystal, 4.5MHz
VARIABLE RESISTORS			
VR201		QVNB3A00B103	Variable Resistor 10kΩ (B)
VR301		QVNB3A00B472	Variable Resistor 4.7kΩ (B)

Ref. No.		Part No.	Description
VARIABLE RESISTORS			
VR401, 410		QVNB3A00B223	Variable Resistor
VR402		QVNB3A00B104	Variable Resistor
VR404		QVNB3A00B104	Variable Resistor
VR405, 406, 408, 411		QVNB3A00B103	Variable Resistor
VR409		QVNB3A00B222	Variable Resistor
VR501		EWAPAAX05B54	Variable Resistor
VR502, 503		EVBJA5J15C15	Variable Resistor
VR504		EVAJA9J15G15	Variable Resistor
VARIABLE CAPACITOR			
CT201		ECRHA010A11	Variable Capacitor
FRONT END			
		SNVFE324A01	Front End Pack
LIQUID CRYSTAL DISPLAY			
LCD901		SALHLC9221	Frequency Display
RELAY			
RL801		SSY129	Relay
COMPONENT COMBINATIONS			
Z301, 302		EXRP152K473T	1500pF, 47kΩ
LAMPS			
PL1		XAMR74S17	Lamp
PL2		XAMR83S250	Lamp
PL3, 4		XAMR74S17	Lamp
FUSE			
F1 [M, MC]	⚠	XBA1F40NU14	125V, 4A
F1 [PA, PE, PC]	⚠	XBA2C31TR0	250V, T3.15A
F2 [PA, PE, PC]	⚠	XBA2C16TR0	250V, T1.6A
SWITCHES			
S401~405		SSH565	Selector
S406~408		SSH3091	TV Sound Mode
S409 [PA, PE, PC] only		SSH169	Allocation
S501~505		SSH569	Mode
S506, 508		SSH1033	EQ, Stereoplex
S507		SSH1206	Tape 3
S601, 602		SSH2106	Speaker
S701	⚠	ESB8216V	Power Source
S702 [PA, PE, PC] only	⚠	ESE37263	Voltage Selector
S703	⚠	SSH1157−1	Tape Selector
S901~918		SSG13	Preset
FLUORESCENT DISPLAY TUBE			
FL		SADBG247Z	Peak Power Ind.

Ref. No.		Part No.
CABINET and CHASSIS P		
1	○	SGWA560−SM
1	Ⓚ	SGWA956−KP
2		SHR415
3	○	SGXA560−SM
3	Ⓚ	SGXA956−KP
3-1		SGX7783
3-2		SGX9011
4		SBC666
5		SGU476
6		SHG438−1
7		SDL90A
8		SUS257
9		SBD116
10		SBE299A
11		SUX38
12		SGX9013
13		SHR9761
14		SBC483−6T
15		SBC565−3
16		SUS802
17		SBZ687
18		SHR9771−1
19		SDU249−2
20		SMP395
21		SUW2950
22		SHR415
23		SUW2963
24		SUW2964
25		SBC571−T
26 [M]		SKUUZ950−KM
26 [MC]		SKUUZ950−KC
26 [other]		SKUA560−SP
26-1		SKL293
27		SHE185
28		SJF3063N
29		SUW2930
30		RHR969ZA
31 [M, MC]		SJT345
31 [PA, PE, PC]		SJT347
32		SUB233
33	○	SKC1760S981
33 [PC]	Ⓚ	SKC1760K991
34 [MC]		SJS9234B
34 [other]		SJS9231B
35 [MC]		SJS9233B
35 [other]		SJS9232B
36		SJF4818−1
37		SJF4228
38		SJF3062−7N
39		SJF4441

ST

ical parts.

ecial characteristics
f these components,

d may differ from

4. Bracketed indications in Ref. No. columns specify the area.
5. The parenthesized numbers in the column of description stand for the quantity per set.
6. Ⓚ-marked parts are used for black only while ○-marked parts are for silver type only.
7. Part other than Ⓚ-and ○-marked are used for both black and silver type.

Ref. No.	Part No.	Description
ES		
	MA4100M	Diode
	MA165	Diode
	MA4062−M	Diode
405	LN846RP	LED
409	LN446YP	LED
408	LN846RP	LED
-505	LN863RCPP	LED
	LN463YCP	LED
	LN463YCP	LED
574	MA165	Diode
-578	MA165	Diode
	MA4062−M	Diode
-704 ⚠	SVDS3V40	Diode
	MA4062M	Diode
	MA2240B	Diode
708	MA4160−L	Diode
	MA4160−L	Diode
-714 ⚠	1SR35200	Diode
802, 804,	MA167	Diode
	MA165	Diode
919 Ⓢ	MA162A	Diode
PA, PE, PC]	MA165	Diode
	1SS254	Diode
S		
	RLQY25S5−O	Choke
	SLA2B1−1M	Coil
	SL02B7−M	Coil
	SL09B1−Z	Coil
302	SLM1B3−K	Coil
	SLM1Z36−1Z	Coil
	SLM1B6−1Z	Coil
602	SLQY07G−30	Choke
	ELEPKR22MA	Choke
SFORMERS		
	SLI4B511−Z	Transformer
	SLI4B513−Z	Transformer
	SLI2B101−M	Transformer
	SLI9B502−Z	Transformer
	SLI9B501−Z	Transformer
	SLA9Z3−K	Transformer
M, MC] ⚠	SLT5N450	Power Source
ther] ⚠	SLT5N451	Power Source
MIC FILTERS		
	SVFE107MM−A	FM, 10.7MHz (Red)
202	SVFE107MM−E	FM, 10.75MHz (White)
	SVFE107MX2−A	FM, 10.7MHz (Red)
	SVFE107MX2−E	FM, 10.75MHz (White)
	SVFSFZ450F7L	AM, 450kHz
	SVFAF41MD70Z	Ceramic Filter
207	SVFSFS45MA	Ceramic Filter
TAL		
	SVQ43U452−D	Crystal, 4.5MHz
ABLE RESISTORS		
	QVNB3A00B103	Variable Resistor 10kΩ (B)
	QVNB3A00B472	Variable Resistor 4.7kΩ (B)

Ref. No.	Part No.	Description
VARIABLE RESISTORS		
VR401, 410	QVNB3A00B223	Variable Resistor
VR402	QVNB3A00B104	Variable Resistor
VR404	QVNB3A00B104	Variable Resistor
VR405, 406, 408, 411	QVNB3A00B103	Variable Resistor
VR409	QVNB3A00B222	Variable Resistor
VR501	EWAPAAX05B54	Variable Resistor
VR502, 503	EVBJA5J15C15	Variable Resistor
VR504	EVAJA9J15G15	Variable Resistor
VARIABLE CAPACITOR		
CT201	ECRHA010A11	Variable Capacitor
FRONT END		
	SNVFE324A01	Front End Pack
LIQUID CRYSTAL DISPLAY		
LCD901	SALHLC9221	Frequency Display
RELAY		
RL801	SSY129	Relay
COMPONENT COMBINATIONS		
Z301, 302	EXRP152K473T	1500pF, 47kΩ
LAMPS		
PL1	XAMR74S17	Lamp
PL2	XAMR83S250	Lamp
PL3, 4	XAMR74S17	Lamp
FUSE		
F1 [M, MC] ⚠	XBA1F40NU14	125V, 4A
F1 [PA, PE, PC] ⚠	XBA2C31TR0	250V, T3.15A
F2 [PA, PE, PC] ⚠	XBA2C16TR0	250V, T1.6A
SWITCHES		
S401~405	SSH565	Selector
S406~408	SSH3091	TV Sound Mode
S409 [PA, PE, PC] only	SSH169	Allocation
S501~505	SSH569	Mode
S506, 508	SSH1033	EQ, Stereoplex
S507	SSH1206	Tape 3
S601, 602	SSH2106	Speaker
S701 ⚠	ESB8216V	Power Source
S702 ⚠ [PA, PE, PC] only	ESE37263	Voltage Selector
S703 ⚠	SSH1157−1	Tape Selector
S901~918	SSG13	Preset
FLUORESCENT DISPLAY TUBE		
FL	SADBG247Z	Peak Power Ind.

Ref. No.		Part No.	Description	
CABINET and CHASSIS PARTS				
1	○	SGWA560−SM	Front Panel Ass'y	(1)
1	Ⓚ	SGWA956−KP	Front Panel Ass'y	(1)
2		SHR415	Nylon Pin	(1)
3	○	SGXA560−SM	Grille Ass'y	(1)
3	Ⓚ	SGXA956−KP	Grille Ass'y	(1)
3-1		SGX7783	Selector Sheet	(1)
3-2		SGX9011	Volume Sheet	(1)
4		SBC666	Button, Power Source	(1)
5		SGU476	Transparent Plate	(1)
6		SHG438−1	Rubber, Indication Plate	(1)
7		SDL90A	Indication Plate	(1)
8		SUS257	Spring	(9)
9		SBD116	Button	(1)
10		SBE299A	Holder	(1)
11		SUX38	Connection Rod	(1)
12		SGX9013	Volume Plate	(1)
13		SHR9761	Volume Holder	(1)
14		SBC483−6T	Button	(7)
15		SBC565−3	Button	(2)
16		SUS802	Ground Plate	(1)
17		SBZ687	Button	(1)
18		SHR9771−1	LCD Bracket	(1)
19		SDU249−2	LCD Filter	(1)
20		SMP395	LCD Lamp Cover	(1)
21		SUW2950	Bracket	(1)
22		SHR415	Nylon Pin	(1)
23		SUW2963	Bracket	(1)
24		SUW2964	Bracket	(1)
25		SBC571−T	Button	(3)
26 [M]		SKUUZ950−KM	Bottom Board Ass'y	(1)
26 [MC]		SKUUZ950−KC	Bottom Board Ass'y	(1)
26 [other]		SKUA560−SP	Bottom Board Ass'y	(1)
26-1		SKL293	Foot	(4)
27		SHE185	P.C.B. Holder	(5)
28		SJF3063N	Terminal Board	(1)
29		SUW2930	Bracket	(1)
30		RHR969ZA	Nylon Pin	(1)
31 [M, MC]		SJT345	Fuse Holder	(2)
31 [PA, PE, PC]		SJT347	Fuse Holder	(4)
32		SUB233	Connection Rod	(1)
33	○	SKC1760S981	Cabinet	(1)
33 [PC]	Ⓚ	SKC1760K991	Cabinet	(1)
34 [MC]		SJS9234B	AC Inlet	(1)
34 [other]		SJS9231B	AC Inlet	(1)
35 [MC]		SJS9233B	AC Outlet	(2)
35 [other]		SJS9232B	AC Outlet	(2)
36		SJF4818−1	Terminal Board (Speaker)	(1)
37		SJF4228	Terminal Board (TV)	(1)
38		SJF3062−7N	Terminal Board (Input)	(1)
39		SJF4441	Terminal Board (ANT)	(1)

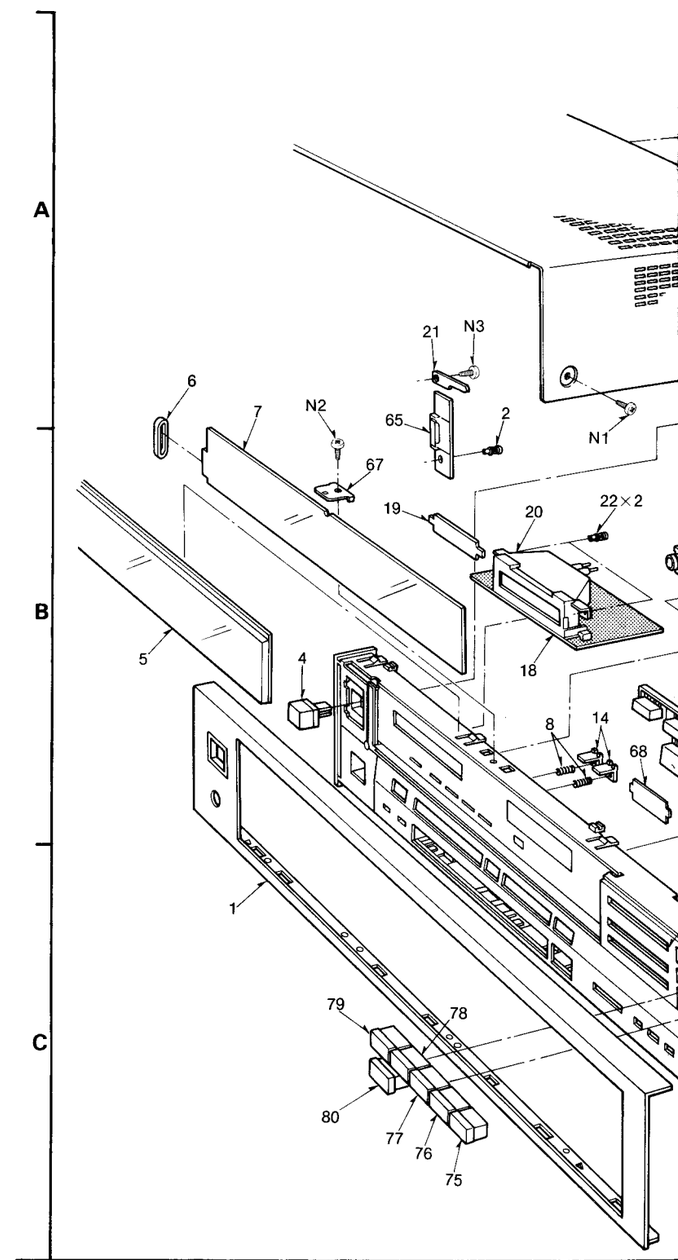
Ref. No.		Part No.	Description	
CABINET and CHASSIS PARTS				
40 [M, MC]		SGPA560−SM	Rear Panel Ass'y	(1)
40 [PA, PE, PC]		SGPA560−SP	Rear Panel Ass'y	(1)
41		SJB3005−2	Battery Case	(1)
42		SJC7	Terminal (A)	(2)
43		SJC9	Terminal (B)	(2)
44		SGK1569−1	Label	(1)
45 [MC] ⚠		SJS9233A	AC Outlet	(2)
45 ⚠ [other]		SJS9232A	AC Outlet	(2)
46 [MC] ⚠		SJS9234A	AC Inlet	(1)
46 ⚠ [other]		SJS9231A	AC Inlet	(1)
47		SUW2928	Plate	(1)
48		SUW2961	Plate	(1)
49		SBWK23	Button	(3)
50		SBZK33	Spacer	(3)
51		SHS1080	Spacer	(1)
52		QJA0455ZC	Headphone	(1)
54		SMP394	Refletor Plate	(1)
55		SJS5327	Socket (3P)	(1)
55		SJS5421	Socket (4P)	(2)
55		SJS5627	Socket (6P)	(1)
56		SJT783	Pin	(2)
57		SJS5215	Connector (2P)	(7)
57		SJS5331	Connector (3P)	(8)
57		SJS5425	Connector (4P)	(1)
57		SJS5629	Connector (6P)	(1)
57		SJS5715	Connector (7P)	(2)
57		SJS5811	Connector (8P)	(1)
58		SJT3213	Socket (2P)	(1)
58		SJT3319	Socket (3P)	(1)
58		SJT3415	Socket (4P)	(3)
58		SJT3611	Socket (6P)	(1)
58		SJT3709	Socket (7P)	(1)
58		SJT3809	Socket (8P)	(1)
60		SJS5533	Socket (5P)	(2)
60		SJS5639	Socket (6P)	(2)
61		SJT3505	Terminal (5P)	(2)
61		SJT3607	Terminal (6P)	(3)
61		SJT3707	Terminal (7P)	(1)
62		SUB245−1	Connection Rod	(1)
63		SUB246−1	Connection Rod	(4)
64		SUB247−1	Connection Rod	(1)
65		SMP390	Reflector Plate	(1)
66		SUW2851−1	Bracket	(1)
67		SUW2965	Bracket	(1)
68		SDU247	Filter	(1)
69		SHR5306	Shield Cloth	(1)
70		SJF3057N	Terminal Board (Tape 3)	(1)
71		SBC527	Button (Tap)	(1)
72		SUW2848−2	Bracket	(1)
74 [M, MC]		SJS305	Socket	(1)
74 [other]		SJS5711−1	Socket	(1)
75		SBC718A	Button (Phono)	(1)
76		SBC718B	Button (Tuner)	(1)

Ref. No.		Part No.	Description	
CABINET and CHASSIS PARTS				
77		SBC718C	Button (CD/aux)	(1)
78		SBC718D	Button (Tape 2)	(1)
79		SBC718E	Button (Tape 1)	(1)
80		SBC718K	Button (Tape 3)	(1)
SCREWS				
N1		SNE2095−4	Cabinet	(2)
N2		XTBS3+8JFZ1	Tapping, ⊕3×8	(3)
N3		XTB3+10BFN	Tapping, ⊕3×10	(1)
N4		XTW3+8T	Tapping, ⊕3×8	(2)
N6		XTB3+10G	Tapping, ⊕3×10	(4)
N7		XTBS3+8JFZ1	Tapping, ⊕3×8	(3)
N8		XTB3+8G	Tapping, ⊕3×8	(2)
N9		XTB3+16BFR	Tapping, ⊕3×16	(5)
N10 [PA, PE, PC]		XYN26+C5FZ	⊕2.6×5	(2)
N11		XTW3+8T	Tapping, ⊕3×8	(2)
N12		XTB3+16BFN	Tapping, ⊕3×16	(2)
N13		SNE2118	IC	(2)
N14		SNE2117−1	TR	(2)
N15		XTBS3+8JFZ1	Tapping, ⊖3×8	(6)
N16		XYN3+C6−1	Screw, ⊕3×6	(2)
N17		XYN3+C6FZ	Screw, ⊕3×6	(4)
ACCESSORIES				
A1		SSA902−4	AM Loop Antenna	(1)
A2		SMA229−1	Antenna Holder B (for Set)	(1)
A3		SMA233−1	Antenna Holder A (for Ruck)	(1)
A4		XTN3+10AFZ	Tapping, ⊕3×10	(1)
A5 [M] ⚠		SJA170	AC Cord	(1)
A5 [MC] ⚠		SJA172	AC Cord	(1)
A5 ⚠ [other]		SJA168	AC Cord	(1)
A6		SSA267−1	FM Antenna	(1)
A7		SJP1108	VCR Cable	(1)
A8 [M]		SQF12505−1	Instruction Book	(1)
A8 [MC]		SQF12506	Instruction Book	(1)
A8 [PA, PE]		SQF12507−1	Instruction Book	(1)
A8 [PC]		SQF12508−1	Instruction Book	(1)
A9 [PA, PE, PC]		SJP9215	Power Plug	(1)
PACKING PARTS				
P1 [M]		SPG5404	Carton Box	(1)
P1 [MC]		SPG5405	Carton Box	(1)
P1 [PA, PE, PC]		SPG5408	Carton Box	(1)
P2		SPS4644	Pad, Left	(1)
P3		SPS4645	Pad, Right	(1)
P4		SPS4617	Pad, Upper	(1)
P5	○	SPP699	Polyethylene Bag	(1)
P5	Ⓚ	SPP723	Polyethylene Bag	(1)
P6	○	SGK1411	Color Sheet (Silver)	(1)
P6	Ⓚ	SGK1413	Color Sheet	(1)

• Change of Part List (SA-956 from SA-560)

Ref. No.	Change of Parts No. SA-560 [M, MC] ➡ SA-956 [M, MC]		Part Name & Description	Pcs/Set
CABINET and CHASSIS PARTS				
1	SGWA560−SM	SGWA956−KP	Front Panel Ass'y	1
3	SGXA560−SM	SGXA956−KP	Grille Ass'y	1
33	SKC1760S981	SKC1760K991	Cabinet	1
40	SGPA560−SM	SGPA956−KM	Rear Panel Ass'y	1
SCREWS				
N1	SNE2095−4	SNE2095−5	Cabinet	2
PACKING				
P1 [M]	SPG5404	SPG5406	Carton Box	1
P1 [MC]	SPG5405	SPG5407	Carton Box	1
P5	SPP699	SPP723	Polyethylene Bag	1

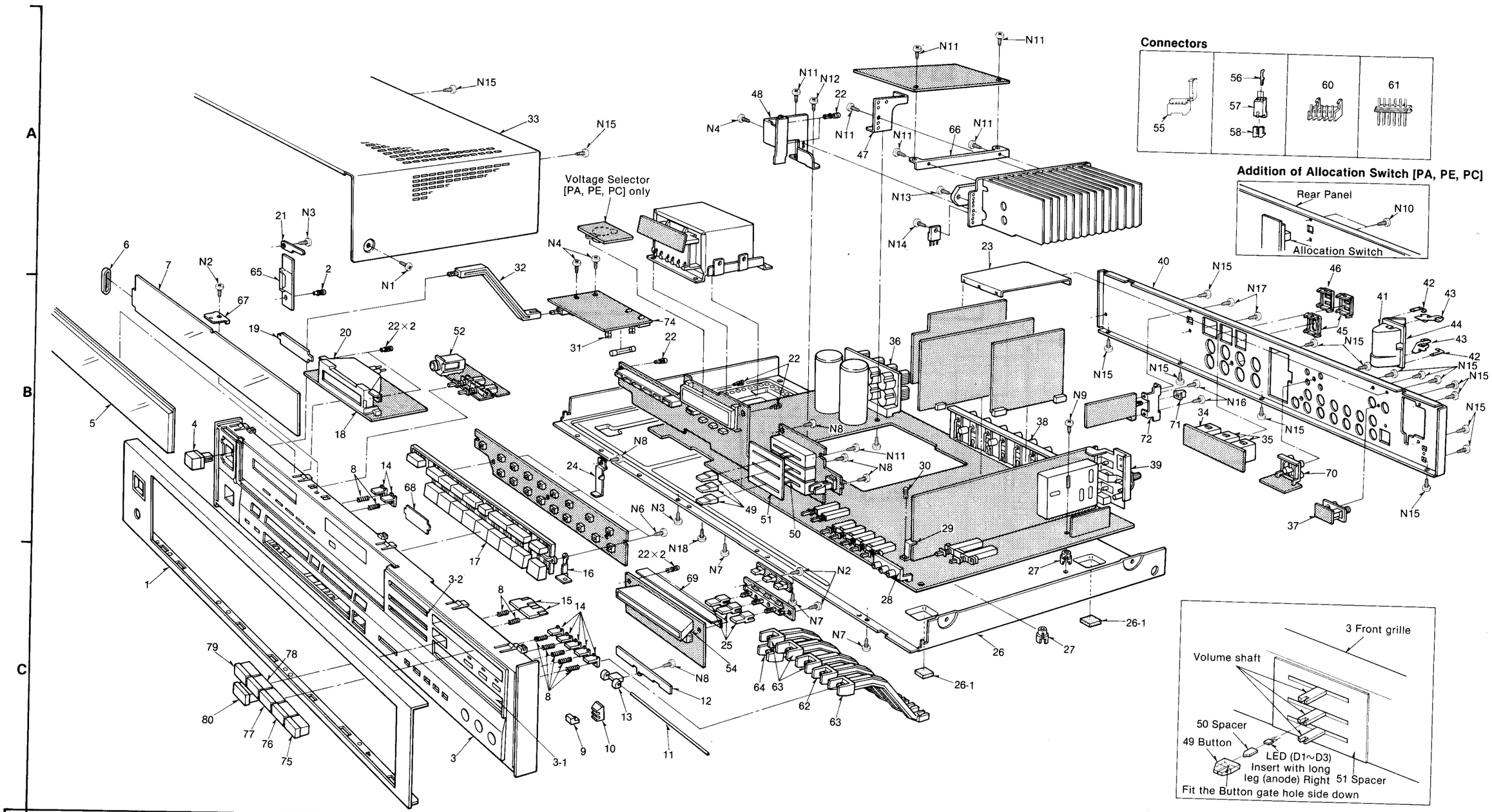
■ EXPLODED VIEW



A	21
B	6 5 7 4 67 65 19 2 20 18 8 22×2 14 68
C	1 79 80 78 77 76 75 3-2

Description	
S	
on (CD/aux)	(1)
on (Tape 2)	(1)
on (Tape 1)	(1)
on (Tape 3)	(1)
net	(2)
ing, ⊕3×8	(3)
ing, ⊕3×10	(1)
ing, ⊕3×8	(2)
ing, ⊕3×10	(4)
ing, ⊕3×8	(3)
ing, ⊕3×8	(2)
ing, ⊕3×16	(5)
×5	(2)
ng, ⊕3×8	(2)
ng, ⊕3×16	(2)
	(2)
	(2)
ng, ⊕3×8	(6)
, ⊕3×6	(2)
, ⊕3×6	(4)
oop Antenna	(1)
na Holder B	(1)
et)	
na Holder A	(1)
uck)	
ng, ⊕3×10	(1)
rd	(1)
rd	(1)
rd	(1)
tenna	(1)
Cable	(1)
ction Book	(1)
ction Book	(1)
ction Book	(1)
ction Book	(1)
Plug	(1)
Box	(1)
Box	(1)
Box	(1)
ft	(1)
ght	(1)
pper	(1)
ylene Bag	(1)
ylene Bag	(1)
heet (Silver)	(1)
heet	(1)

■ EXPLODED VIEW



| | | |